Engineering News-Record

A Consolidation of Engineering News and Engineering Record

A JOURNAL OF CIVIL ENGINEERING AND CONSTRUCTION

ISSUED WEEKLY

VOLUME LXXXIII

July 1 to December 31, 1919

McGRAW-HILL COMPANY, INC.
10TH AVENUE AT 36TH STREET
NEW YORK

ENGINEERING NEWS-RECORD

INDEX TO VOLUME LXXXIII

July 1 to December 31, 1919

PAGES

July	3	1 to	48
July	10	49 to	103
July	17	105 to	152
July	24	153 to	200
July	31	201 to	248
Aug.	7	249 to	296
Aug.	14	297 to	344
Aug.	21	345 to	396
Aug.	28	397 to	446
Sept.	4	447 to	490
Sept.	11	491 to	538
Sept.	18	539 to	588
Sept.	25	589 to	636
Oct.	2	637 to	684
Oct.	9	685 to	716
Oct.	16	717 to	748
Oct.	23	749 to	780
Oct.	30-Nov. 6	781 to	844
Nov.	13-Nov. 20	845 to	908
Nov.	27-Dec. 4	909 to	972
Dec.	11-Dec. 18	973 to	1036
Dec.	25	1037 to	1084

A

Page

Abbot, Col. F. V., acting chief of engineers, U. S. A. n715
Abbott, H., on small river terminal for widely varying water stages *999
Abrams, D. A., on does rich concrete in roads crack more than lean?..e491, 518
Receives Wason medal n42
Accident-prevention highway spurs at railroad grade crossings (A. L. Wyman) letter 94, (H. G. Butler) ..... letter 286

ACCIDENTS, see also SAFETY

Fall of dirigible balloon in Chicago e153
Grade crossings, prevention by highway spurs suggested (A. L. Wyman) letter 94, (H. G. Butler) ..... letter 286
Grain-elevator at Port Colborne, board of engineers appointed to investigate, by Canadian Government n442
Lower Otay dam failure called by court "Act of God" n340
Adams, E. E., on protecting viaduct from snowslides by concrete walls *470
Adler, A. A., on design of riveted butt joints after Schwedler assumptions *765
Administrative areas and watersheds should coincide (C. G. Lyman) ..... letter 239

AERONAUTICS

Air patrols detect forest fires 120
Airship (dirigible balloon) completes round trip across Atlantic n148
Balloon, dirigible, completes round trip across Atlantic n148
Balloon, dirigible, falls in Chicago e153
Municipally owned landing fields 413
Service progress e638
Sheds, French, built of framed concrete. *702
Travel e397
War, and gas warfare e591
Aëroplanes, see Aëronautics
Air, dust in, standard methods of ascertaining 936
Air-compressor, gas-driven, portable n*684
Airplanes and Airships, see Aëronautics
Air pockets prevented in concreting scroll case, by use of curved pipe (R. C. Hardman) h*963
Akron, Ohio to appoint manager n968
Garbage collection and disposal (F. C. (Tolles) 1013
Water-works improvements 608
Alaska coast line measured by sextant and stadia-rod method (B. A. Baird) 647
Fairbanks district gold yield 854
Alaska Railroad, more money asked n196
Alaska Railroad Commission, Colonel Mears made chairman and chief engineer. n340
Albany, N. Y., brick water conduit gives long service 768
Savings made by motorizing street-cleaning equipment *762
Water-works e591, 604, 605; one hundred years ago e591, 605
Allen, C. F., on "Case system for study of law" 183
Allen, J. R., resigned as dean of college of engineering, University of Minnesota n246
Allen, K., on sewage and dissolved oxygen in New York harbor *228
Allen, M. E., on fabricated-ship plant planned for later general use *79
Alloys, bearing value 420
America in European eyes e750

AMERICAN ASSOCIATION OF ENGINEERS

And founder societies n966
Attitude on trade unionism n903
Baltimore Chapter urges increase of pay of city engineers n714
Chicago Chapter to start business courses for members 579
Cincinnati Chapter urges increase of rapid-transit engineers' pay n714
Committee chairmen n839
Committee on engineers' pay n101
Committee proposes salary schedule for highway engineers 677
Employment work ..... e974; (E. B. Miller) letter e1025
Established Federal department in Washington n714
Headquarters, new n487

Page

Navy Technical Association joins n44
New York Chapter indorses General Langfitt and discusses freight pier design n777
New York Chapter joins New York Union of Technical Men in pay demand n488
Not technical organization, it states n1029
Or new engineering council? (K. B. Knudsen) ..... letter 237
Proposes salaries of highway engineers in state employ n714
Publicity contest *959
Rapid-Transit section, New York City, organized n969
Supports Jones-Reavis bill for Public Works Department n532
To admit architects n679
Wood, Gen. Leonard, joins n1029
American Association of State Highway Officials, address of A. R. Hirst e845, 856
American Association of State Highway Officials, annual meeting n1029
American Automobile Association issues booklet, "National Highway System" n152
American Chemical Society to meet n341
American Concrete Institute, Convention n41
American Federation of Labor, farmers will not affiliate with e717
Bill of rights e1037, 1038
On trial e539
American Institute of Architects, model registration law e846
American Institute of Consulting Engineers, committee on ethics renders decisions on ownership of plans and state engineer's right to practice 365
Council protests to President against Plumb plan *405
American Public Health Association convention n714
Abstracts, reports and discussions at meeting 882
Meeting of sanitary engineering section. n488
American Railway Bridge and Building Association to meet n679
American Road Builders' Association meeting n744

AMERICAN SOCIETY FOR TESTING MATERIALS

Adopts new standards for materials n583
Convention e1, 9
In new headquarters n679
Refuses to grant money for National Service Committee e1, 9
Warwick, C. L., new secretary-treasurer. 9

AMERICAN SOCIETY OF CIVIL ENGINEERS

Connecticut Association formed n634
Davis, A. P., selected by nominating committee for president n714
Development Committee report commended (W. H. Woodbury) ..... letter 141
Development Committee report (R. E. Spear) ..... letter 433
Development Committee signs final report n679; is discharged n714
Development Committee report ..... e846; discussed n902
Development Committee report, Philadelphia Association begins campaign for n1077
Discusses compensation of engineers n745
Discusses Public Works Department bill. n830
Discusses railroad nationalization n775
District of Columbia Association indorses comprehensive engineering organization n1081
Illinois Association cooperates with Western Society of Engineers n634
Philadelphia Association of Members, energy and accomplishment 1069
Philadelphia Association begins campaign for Development Committee report. n1077
American Society of Mechanical Engineers, proposed activities, report on 22
Alliance with employers e750
Recommends new by-laws for student branches 991
Secretary Rice reports on work of Joint Employment Bureau ..... e974; (E. B. Miller) letter 1025
American Society of Municipal Improvements meeting n775
Americanization, leaders in e685
American Water Works Association to have New York home 533
New York Section meeting 969
Nominating committee elected n969
Andrews, Lieut. S. H., on bridging Rhine by American Army engineers *119
Anthony, C. W., on hexagonal chart for finding velocity of water in pipes. e153, *169
Anthony, G. C., on changes at Tuft's College engineering school 185

APPLIANCES

Arch supports, light for canvas sun shields h*1074
Backfiller, improvised, cuts costs on Panama sewer job (R. C. Hardman). h*834
Belt, bow-frame, for finishing concrete roads h*40
Boardwalk for motor truck h*337
Boring machines improvised from electric drill h663
Casters increase utility of pinch bar. . h*1028
Chain tilts and dumps truck body h*773
Dishpans used for light reflectors (A. S. Fry) 1195
Drag, special, finishes channel slopes dug by dragline excavator (B. L. Zull) h*96
Endless-track arrangement for carrying away at steam shovels (D. J. McFadden) h*484
Flanging machine, for thin steel plates, built on job h*628
Gage glass on barrel measures water for concrete h*773
Knuckle guard for wheelbarrow handles (J. H. Sawkins) h*1074
Mixer for mastic pavement filler h*338
Pinch bar, utility increased by casters. h*1028
Rig used for sounding under piers (R. W. Beuttenmuller) h*1075
Road digger for breaking old macadam before resurfacing h*195
Special rig for jacking up spans to renew baseplates (C. Baker) h*832
Steel ribs on wide concrete-finishing belt prevent warping h*712
Sun shields, canvas, light arch supports for h*1074
Templet with saw teeth cuts off and finishes concrete road surface h*833
Tightener and clamper for wire pipe-bands n*48
Toggle relieves load on bridge posts during reinforcement work h*743
Trailer, device for lifting and coupling. n*972
Turnbuckle adjustment for hammer clutch (E. E. Glass) h899
Valve, home-made, quick-opening for small tanks (D. J. McFadden) h*713
Wedge, spreading, for striking arch centers h*713
Aqueduct canal, bridge over, combined with headgates *610
Arabian port benefited by light railway 503
Arch built with primitive centers h*900
Arches, groined or flat roof for concrete reservoirs, 566, (T. C. Atwood) letter 673

ARCHITECTS

American Institute of Architects' model registration law e846
Buffalo, forwarding Board of Education's building program e910
Licensing law, Illinois n243
Michigan registration board n967
New York State Association formed e448, n488
Profession organized e448, n488
To be admitted to American Association of Engineers n679
To design and supervise Pittsburgh bridges e686, n714
Arcs, elliptic, computation of lengths (G. Paaswell) 221
Armstrong, J., on backfilling tunnel through holes poured from surface *174

ARMY, UNITED STATES

Chief of Engineers, delay in naming n902
Construction Division, Conference on Public Works would make it part of Department of Public Works n968
Fate undecided n1031
Corps of Engineers and Auxiliary Engineer Corps (M. O. Leighton) . . letter 237
Ability vs. seniority e719
Contest for chief n744
Not behind Auxiliary Engineer Corps (Maj. Gen. W. M. Black) letter 141, (M. O. Leighton) letter 237
Versus national Department of Public Works (I. Randolph) 561
Engineers:
Bridge Rhine in record time (Capt. J. M. Farrin and Lieut. S. H. Andrews) *118
Casualties third highest 576
Chief of, delay in naming n902
Credit for e447
Payment of mileage n100
General Staff bill a menace to technical services, e346, 358, (G. D. Snyder) letter 435, ("Ex.") ..... letter 481
Influenza and pneumonia in camps (Maj. G. A. Soper) *72
Light-railway practice in France (P. McGeehan) *635
Materials, surplus, for sale n442
Motor trucks for highways n714, 746
Military policy discussed by Am. Soc. C. E. n714
New Orleans supply base, building *122
Pneumonia and influenza in camps (Maj. G. A. Soper) *72
Road-building plant may go to states .. n533, n583
School at Camp A. A. Humphreys (Maj. C. C. More and Capt. W. E. Duckering) 183
Training school for engineers at Camp A. A. Humphreys n196
Work among most notable achievements of A. E. F., says General Pershing n1030
Arneson, E. P., on pile foundations for unequal load distribution *698
Art national bureau proposed by J. Pennell 194
Ashpit, double-track water-type, Pennsylvania R.R. *408
Ashpits, railway, of new design *1007

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

ASPHALT
Asphalt Association establishes office in Washington n908
Asphalt Association service department. n101
Device indicates proper grade to use.... *200
Lectures on, at colleges n836
Pavement, device for scooping up and loading (R. H. Moulton) h*289
Trinidad Lake, maximum sounding.... 132
Asphalt Association, aims, etc. e398
Investigates college highway courses.... n487
Service department n103
Asphalt-block handling at Army base.... h*439
Assessments, paving, computation of (R. D. Gladding) ..... letter 672

ASSOCIATED GENERAL CONTRACTORS OF AMERICA
And General Contractors' Association to consolidate publications n680
Joined by Cincinnati contractors n1077
Organize subsidiary, Contractors' Service Corporation n485
Plan highway conference n715
Set dues n837
St. Louis contractors join n970
To be represented by C. A. Crane n394
Association of Ohio Technical Societies on status of engineer 671
To meet n634
Associations, promotional aims of, etc.... 398
Astronomy for surveyors (book review by H. J. Hughes) 891
Athens, Greece, American engineers to install water-works n392
Atlanta council favors municipal ownership. 216
"Atlantus," first Government concrete ship, commissioned n441
Atmosphere, dust in, standard methods of ascertaining 936
Augusta, Ga., protecting banks of Savannah River *410
Austin, Tex., new sewage works *1066
Australia has large irrigation projects.... 215
Highway activities n340
Auxiliary Engineer Corps and Corps of Engineers (M. O. Leighton) ..... letter 237
Not supported by Corps of Engineers (Maj. Gen. W. M. Black) letter 141, (M. O. Leighton) letter 237
Avery, F. H., on new type of wood and asphalt flooring for Chicago bridges.... *866

B

Backfiller, improvised, cuts costs on Panama sewer job (R. C. Hardman) h*834
Backfilling tunnel through holes bored from surface (J. Armstrong) *174
Bailey, F. S., on diagrams for excess loss of head in pipe lines *162
Baird, B. A., on sextant and stadia-rod method for measuring distance 647
Baird, S. P., on universal form for skew culvert ends h*901
Baker, C., on special rig for jacking up bridge spans h*832
Baker, C. W., on freight transportation by motor truck or railway.... e2, e50, 52, (W. Jackson) letter 434; (J. Wilkes) letter 829
On "The Railway Problem".. announced 719, 752, e783, 789, e749; (F. Lavis) letter 1070
Transportation monographs e781
Baldwin, R. L., on unit costs for use in public utility appraisals *514
Balloons, see Aëronautics.
Baltimore urged by A. A. E. chapter to increase city engineers' pay n714
Paving recorded by map and file system (R. K. Compton) *865
Water-supply; sanitary effect of water storage in open reservoirs (A. Wolman and S. T. Powell) *804
Water-works, enlargement recommended (W. E. Lee) n630
Band spacing for wood-stave pipe diagram for computing (W. T. Batcheller) *472
Barge canal terminal opened in New York City (F. M. Williams) *1047
Bartholomew, H., on amendments to St. Louis zoning ordinance 403
Bartlett, T., on tidal storm at Corpus Christi and effect on engineering structures *848
Batcheller, W. T., on diagram for computing band spacing for wood-stave pipe.. *472
Bathing places, public, state control in Florida 312
Bayles, G. H., on constructing 98-km. water conduit in Chile, *593; correction 1063

BEAMS
Concrete, diagram for locating stirrups in (M. J. Lorente) *310
Continuous, and rigid frames, deflection of (F. E. Richart) *564
Loads, safe, easily memorized method for finding (M. E. Hibbs) ....115, (G. S. Burrell and W. H. Cullers) letters 388
Reactions and bending moments, diagrams for (R. Burnham) *956
Steel and wood, safe loads on (H. F. Blood) ..... letter 526
Yellow-pine tested for shear with concentrated loads (L. R. Mancille and C. R. Hill) ..... *89, (H. D. Dewell) letter 336
Beckworth, A. J., on oil drum makes portable concrete mixer h*531
Belgium, low wages in e685
Belt, bow-frame, for finishing concrete roads h*40
Benchmarks, depressed permanent set in concrete floors (L. C. Scott) *365
Berkeley, Calif., lets entire water front at private lease n101
Berlin buys street railway system 175
Beuttenmuller, R. W., on material under piers removed by jetting with hydraulic dredge h*775
On rig used to sound under piers.... h*1075
Bibbin, J. R., on effect of deferred earnings on capital value *947
Birmingham, Ala., port of, work commenced n1034
Black, Gen. W. M., discusses military policy n714
Retires n715
Blair, W. P., on is beam strength the important item in brick roads? 699
Blasting tests show TNT stronger than 40% dynamite h145
Blenderman, H., on construction labor's instability 939
Block yard cheaply improvised from old equipment *356
Boards, reinforced-concrete, straightened. h*901
Boiler-house structure and fittings, concrete used in (G. S. Nobles) *262
Boiler plates, old, for coffer plates (G. W. McAlpin) h900
Boiler water, treatment n323

BOLTS
Construction, tight nuts on h484
Experience with.... e298, (R. Fleming) *316, (W. E. Belcher) letter 529, (H. B. Tabor and E. D. Coddington), letter 896
In field connections of steel-frame buildings (R. Fleming) ..... e298, *316, (W. E. Belcher) letter 529, (J. E. Bernhardt and W. L. Kelly) letters 771
Bonds, corporate contract, function of (E. W. Bush) ..... letter 142
Criticism of business answered (H. V. Swart) 669
Book prices barred by Postoffice Department from reviews.... e345, 379, 382, (C. J. Tilden) letter 482, (W. A. E. Doying) letter 580

BOOKS
"American Air Service" (Sweetser) 138
"American Labor Policy, An" (Cohen).. 742
"America's Munitions, 1917-1918" 138
"Analysis of Statically Indeterminate Structures by the Slope-Deflection Method (Wilson, Richart and Weiss) 138
"Boiler Chemistry and Feed-Water Supplies (Paul), (reviewed by G. C. Whipple) 380
"Book of the National Parks," (Yard).. 1022
"Condensed Chemical Dictionary" 1022
"Construction of Graphical Charts" (Peddle) 139
"Delaware River Bridge and Tunnel Commission Report" 380
"Democracy in Reconstruction (F. A. Cleveland) 578
"Design of Walls, Bins and Grain Elevators" (Ketchum) 139
"Draftsman, The" (Shelmire) 380
"Elastic Stresses in Structures" (Castigliano; translated by Andrews) 381
"Electric Power Transmission" (Still).. 381
"Elements of Astronomy for Surveyors" (Chapman), (reviewed by H. J. Hughes) 891
"Employment Management" (D. Bloomfield) 577
"Engineering Education; Essays for English" (Baker) 891
"Field Engineering" (Searles and Ives).. 139
"Forest Products, Their Manufacture and Use" (Brown) 1021
"Gasoline Automobile" (Hobbs and Elliott) 892
"Government of the United States" (Munro) 139
"Health Officer, The" (Overton) 1023
"History of Indian Railways" 381
"Houses, Site Planning Utilities (report of U. S. Housing Corporation) 578
"How France Is Governed" (Poincaré).. 139
"Hydraulics" (Daugherty) 892
"Hydrology" (Mead) reviewed by F. H. Newell 1021
"Incidents in the Life of a Mining Engineer" (McCarthy) 1021
"Industrial Good-Will" (Commons) 380
"Labor Turnover, Loyalty and Output" (Colvin) 381
"Law of Government Contracts" (Shealey) 380
"Machine-made Cement Pipe for Irrigation Systems and Other Purposes" (Smith) 139
"Municipal Ownership, 100 Reasons Why 100 Cities Have Changed to" 742
"New Towns After the War" 892
"One Hundred Reasons Why 100 Cities Have Changed from Private to Municipal Ownership" 742
"Orifice as a Means of Measuring Flow of Water Through a Pipe" (Davis).. 1022
"Record of War Activities" (Turner Construction Co.) 139
"Shell Loading at Amatol, N. J." (Atlantic Loading Co.) 139
"Shore Processes and Shoreline Development" (Johnson) 138
"Socialism and American Ideals" (Myers) 891
"Southern Yellow Pine" 891
"Statistics of Government Railways in China" 892
"Tables of Mechanical Properties of Materials" 379
"Tests of Metals and Other Materials" (at Watertown Arsenal) 138
"Timber" (H. S. Betts) reviewed by F. W. Dean 577
"Town Improvement" (Evans) 742
"Trautwine's Civil Engineer's Pocket-Book" 137
"United States Reclamation Service".... 1021
Booth & Flinn get Pittsburgh tunnel contract n903
Boring machine improvised from electric drill h*963
Bosard, R., on determination of Kutter's roughness in drainage ditch *921
Boston, Army supply base wharf, semi-portal dock cranes *516
Boston, supply bureau to be reorganized.. n842
Bow-frame belt for finishing concrete roads h*40
Box-car shortage due e152
Breed, H. E., on what has New York received for $100,000,000 road expenditures? e447, 450
Brewer, B., on control of new streets in relation to extension of water mains.. 705
Brick, lugless standard for paving brick.. e845
Brick Manufacturers' Association (common brick) to advertise n343
Brick water conduit gives long service.... 768
Bridgeport District Salvage Board issues weekly bulletin n151

BRIDGES
Arch bridge pier, test of sandy foundations (A. Richards) *208, (H. Abbott) letter 772
Arch bridges, historic, strengthened.... *431
Arches, flat on high piers, South Side bridge, Fairmont, W. Va. *270
Bascule, Chicago, span increased to allow swing-bridge to operate 309
Largest single-leaf, Chicago River.... *1056
Michigan Ave., Chicago, substructure (H. E. Young and W. A. Mulcahy) *210
Single-leaf, in double-leaf bridge.... 189
Bethlehem, Penn., to be contracted for by Public Service Commission n1081
Cast-iron, historic, jacketed with concrete 134
Chicago River, largest single-leaf bascule *1056
Coal Valley, Penn.; unusual design and joint details e639, *656
Concrete:
Arch bridge with ribs anchored by concrete keys (C. B. McCullough) *924
Lightning pushes sidewalk off *68
Spreading wedge for striking arch centers h*713
Through concrete arch, to give large waterway (F. W. Epps) *994
Wide bridge built as two bridges without interval *928
Cumberland River suspension (W. G. Grove) *4
Delaware River, appropriation asked.. n1033
Design and joint details, unusual, of 430-foot bridge, Coal Valley, Penn., e639, *656
Design, Rondout Creek, condemned for excessive load on batter piles.. *329, (W. E. Belcher) ..... letter 479
Detroit, bridge across American channel, bill passed by United States Senate; plans for n904
Project studied n969
Drawbridge, extraordinary repairs to 1900-ton bridge *366, e398
Drip floor, steel-plate, for Niagara railway arch *620
Fairmont, W. Va. *270
Floors, replaced after corrosion.. e541, *582
New type, wood and asphalt, for Chicago bridges (F. H. Avery) *866
Foundations, cofferdam experience, Chicago River (H. E. Young and W. A. Mulcahy) e249, *268
Arch bridge pier, test of sandy foundations (A. Richards) *208, (H. Abbott) letter 772
Girder expansion bearing fails to slide.. 652
Highway and culvert surveys, Iowa.... 140

Highway Bridges:
Corrosion of steel e541, *582
Covered wooden economical in Oregon 215
Wheel guards *282
Wheel loads on floors (H. F. Blood) letter 190
Home-made, two, in Catskill village (R. Fleming) *568
Inspection contract proposed in Portland, Ore. n776
Iowa highway and culvert surveys..... 140
Lift spans, timber, spiral drums for operation of *803
Michigan Ave., Chicago, bascule, substructure (H. E. Young and W. A. Mulcahy) *210
Military e448
Military, in active warfare (L. E. Moore and M. W. McDonald)..e687, *688, *734, (J. W. Pearl) ..... letter 1073
Nashville, design features and erection methods (W. G. Grove)..... *4, (D. Ording and W. G. Grove) letters 527
New York, traffic separated n487
Niagara railway arch, steel-plate drip floor for *620
Reinforced for heaviest traffic..... *577
Niagara, toggle relieves load on posts during reinforcement work h*743
Pier drops span n680
Pittsburgh, architects employed to design and oversee construction.... e686, n714
New plan for n715
Pottstown, Penn., floor replaced after corrosion e541, *582
Railway:
Floors e639
Painting, paint service and paint technology 827, (A. H. Rhett), letter 1072

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Specifications....e2, 33, e51, (E. Godfrey) ....letter 437
Replacement problem in Chicago..... 309
Rhine bridged by American Army engineers in record time (Capt. J. M. Farrin and Lieut. S. H. Andrews)....*118
Rondout Creek, design condemned for excessive load on batter piles....*329 (W. E. Belcher) letter 479
Roumanian, wrecked during war.....*182
Special rig for jacking up spans to renew baseplates (C. Baker).....h*832
Spiral drums for operation of timber lift spans *803
Steel-plate drip floor for Niagara railway arch *620
Stress reversal e51
Substructure of Michigan Ave. bascule bridge, Chicago (H. E. Young and W. A. Mulcahy) *210
Surveys, Iowa 140
Suspension, 540-foot, design features and erection methods (W. G. Grove) *4, (D. Ording and W. G. Grove) letters 527; (D. Ording) letter 711
Largest in New Zealand (O. Johnson) *263
331-foot, erected with unskilled labor (A. M. Truesdell) .....letter *241
Susquehanna River memorial, at Harrisburg, Penn., contract for is let.....n714
Through concrete arch, to give large waterway (F. W. Epps).....*994
Timber, on Alaska railway.....*420
Toggle relieves load on posts during reinforcement work h*743
Toll, to be purchased by New York and Pennsylvania 860
Train-ferry, English Channel (P. J. Risdon) *660
Triangular, and H. E. Horton (J. W. Pearl) .....letter 1073
Unusual design and joint details of 430-ft. bridge *656
Wide, built as two bridges without interval *928
Wilmington, Del., memorial arch bridge, bids to be asked n779
Engineer chosen by competition.....*806

Bristol, Conn., paying for water-main extension at 772
British city engineer, problems of.....1006
British Columbia Technical Union now B. C. T. Association.....n837
Activity 1069
Brooklyn Army supply base, freight handling e540, *555
Paving of streets and aisles....*400, h*439
Brush, W. W., on insulation resistance in motors reduced by moisture.....a818
Budget, national, indorsed by Engineering Council committee.....n714
Promotion, *The National Budget*..... 892
Buffalo, N. Y., architects forwarding Board of Education's building program.....e910
Buffalo sells garbage on Chicago hog-price basis n197
"Building for Victory," by Col. W. A. Starrett 139
Building, 3000-ton, moved 450 feet by electric hoists *706
Building-association stock provides plant-replacement fund (O. H. Yeager) h1027
Building materials, prices, 1914-1919....*799
British and American (A. G. Duke) letter 142
Building trade wage increase since 1913..*788
Building trades, "team spirit" plan, British 1000
Building trades employers and employees sign two-year wage agreement.....n905

BUILDINGS

Concrete, addition made at reasonable cost *75
Concrete and steel framing combined for economy *178
Concrete, large, at stockyards, Denver..*413
Handling materials in construction of New York hotels.....*222
Steel and concrete framing combined for economy *178
Steelwork for, common errors in detailing (E. Godfrey), 1730; (L. C. Jordan), letter, 961; (G. Paaswell), letter 962

Bulletin of the Associated General Contractors of America, to be issued.....n680
Bureau of Housing and Living Conditions, bill drafted n393
Bureau of Mines to dedicate new Pittsburgh laboratories n583
Bureau of Public Roads, enlargement asked by Mississippi Valley Association....n1077
Bureau of Standards' current budget.....n969
Annual report 1060
Burkholder, J. E., on dragline excavator helps itself to fuel and lays track over soft ground h*582, h*1047
On drainage works of Rio Grande irrigation project *543
Burlington, Vt., water-supply filtered and chlorinated 655
Burnham, R., on diagrams for reactions and bending moments of beams.....*956
Burpee, R. W., on heavy double trestle for shipbuilding cranes (R. W. Burpee), e717, e718, *723
Bus depot, union, at Los Angeles n1080
Business for breakfast.....e782
Butcher, W. L., on what will engineers pay to improve their status?..... 722
Butts, W. M., on what will engineers pay to improve their status?..... 722
Bypass filter valve, faulty, cause of Moline, Ill., typhoid outbreak e106
Cable incline handles dump cars in building wet fill.....h*96

C

Page

Caissons, suspended pneumatic place dam foundation *108
Telescopic foundation, sunk in bank basement (F. H. Eastman).....*369
Calculating machines in Geological Survey work. 422

CALIFORNIA

C. H. Lee appointed water commissioner. n714
County engineers replace county surveyors. n197
Highway bond issue carried.....n99
State council of engineers in process of formation. 284
Cameron Co. settles claims for septic tank royalties. n714
Camouflage powder magazines look like trees (Maj. G. C. Muñoz) *280
Camp, A. A. Humphreys, Army Engineer School (Maj. C. C. More and W. E. Duckering).....183
Camps, Construction (see Construction Camps).

CANADA

Commission on Industrial Relations, report. 223
Electric generating plants.....207
Government railway operation shows loss. n148
Health Department, new 36
Housing aid, Federal and provincial.... 649
Impressions here and there—from Niagara to Ottawa. 797
Opposition to purchase of Grand Trunk Railway. n715, n745
Railway War Board abolished, Railway Association of Canada formed.....n837
Waterways convention.....n967
Canadian Pacific Railway plans extension of Kipawa branch n839

CANALS

American, at Sault Ste. Marie, fourth lock opened. n678
Cape Cod, $16,000,000 for n779
Grand, China, improvement to be designed by T. H. Wiggin.....n441
Gulf to Atlantic proposed.....n98
Lock closed by dam supported by bascule bridge. *116
New Jersey ship canal agitated.....n836
New York Barge, largest terminal opened in New York City (F. M. Williams)..*1047
New York Barge; state wants full control of rates.....n243
Rates, bill to give Interstate Commerce Commission control. n243
Sand removed by sluicing 998
Sault Ste. Marie, fourth lock opened....n678
St. Lawrence system, proposed enlargement. n679
Trolhättan, Sweden, dam supported by bascule bridge closes lock.....*116
Welland Canal work shut down.....n680
Canning-plant wastes, in Wisconsin, treatment (E. J. Tully) *1017
Canvas chute prevents cement dusting....h*440
Canvas pipe gives flexible distribution of sluicing water. h*390
Cape Cod Canal, $16,000,000 for.....n779
"Cape Fear," Government concrete ship, launched. n*291
Capital value, effect of deferred earnings on (J. R. Bibbin) *947
Carnegie, A., obituary.....e297, n339
United Engineering Society's tribute to..n394
Carver, T. H., and J. H. Quense, on tests of concrete in tension *1005
"Case system," changes in engineering curricula, and business training for engineers....e153, 183, (J. K. Finch) letter 285
Casters increase utility of pinch bar....h*1028
Caterpillar steam shovel makes construction railway fill h*1028
Caterpillar tractor hauls gravel in Minnesota. *227
Castings, X-ray examinations for blowholes..234

CEMENT

American exports not excessive in 1919..1061
Bin; measuring box reduces clearance in. h*532
Companies, Federal action against..e347, n392
Dusting prevented by use of canvas chute. h*440
Export company elects officers.....n844
Exports lower than in any year since war began e1037
Fineness requirement, Government, postponed. n744
Flat-car stock pile for paving mixer..h*1076
Kansas companies sued for restraint of trade. n196
Nevada may have State mill.....n197
Production fell off in 1918.....129
Testing by Government.....e782, 825

Cement gun, lining reservoir with (E. C. Eaton) *167
Cement joints for cast-iron water mains at shipbuilding plant (A. J. Newman).....609
Census, fourteenth.....831
Irrigation in (R. P. Teele).....926
Manufactures to be carefully enumerated 929
Chain Belt Co., new plant.....n684
Chain tilts and dumps truck body.....h*773
Chamber of Commerce of United States admits Engineering Council.....n714

Page

Committee on Department of Public Works n1033
Referendum vote on return of railways to owners. n29
International trade conference postponed.n680
Chandler, E. M., on reconstruction of Naches-Selah irrigation canal.....*27
Chaney, R. C., on soil exploration by pipe-sounding h*43
On special targets facilitate survey of flood works *76
On unusual concrete retaining wall section has raised heel.....*6
Changed dollar and the engineer....*182, e20
Changes in value of dollar.....*9
Channel, concrete, for stream over fractured mine outcrop (H. A. Coy).....*32

CHARTS

Concrete road specifications, summary (A. N. Johnson).....*16
Curve, for railway resurvey (J. G. Wetherell).....*50
Hexagonal, for finding velocity of water in pipes (C. W. Anthony).....e153, *16
Chemical industries, fifth national exposition. n490
Chester Shipbuilding Co. and Merchant Shipbuilding Corporation consolidated.....n341
Cheyenne, Wyo., corner gutters depressed...424

CHICAGO

City engineer, examination for is urged.n1077
City engineers get increase.....n29
Increase in motor vehicles.....28
Lake-front $140,000,000 improvement. n196, *216, correction *360
Smoke problem civic more than engineering. n101
Technical employees hear union labor leaders n1081
Theater and office building, combined steel and concrete framing.....*178
To vote on $28,000,000 bonds for improvements n14
Votes improvement bonds.....n836
Chicago Drainage Canal, lake water diversion and sewage treatment.....231
Chicago River, closing to navigation suggested. 321
Chicago Sanitary District will build 60 miles of road.....n100
Chicago to Liverpool by steamer.....n43
Chicopee, Mass., steel standpipe subject of suit e1039, 1053
Chief of Engineers, U. S. A., delay in naming. n90
Chile, constructing 98-km. water conduit in (G. H. Bayles), *593; correction 1063
Topographical surveying on Atacama desert (B. L. G. Rees).....*22
Chimney, highest, built for Anaconda, Mont., smelter. *76
China, Grand Canal improvement to be designed by T. H. Wiggin.....n441
Chloramine, permanent plants for, installed at Denver. *60
Churches and labor e91
Chute, canvas, prevents cement dusting...h*440
Cincinnati completing meter program.....876
Cincinnati Rapid Transit Commission urged by A. E. chapter to increase engineers' pay. n714

CITIES

Atlanta council favors municipal ownership 216
Berkeley, Calif., lets entire water front at private lease n101
Berlin buys street railway system..... 175
British municipal engineer, problems of.1006
Centralization of city traffic.....e154, *170
City planning, progress in..... 249
Consulting engineers, board of, for Columbus, Ohio 1073
Effect of size of lots on industrial housing (M. Knowles) 955
Garden suburb and housing plan, Ottawa, Ont. *412
Home rule cities, Colorado, may regulate utility rates 214
Kansas City Engineers' Club to get growth data on which to base civic opinion 93
Landing fields for airplanes, municipally owned 413
Markets, municipal, in United States.... 496
Minneapolis will have right to buy street railways n633
Monroe, La., engages city consulting engineer and works director..... 82
Municipal ownership favored by Atlanta council 216
Municipal savings bank, St. Paul..... 407
Newark, N. J., zoning ordinance.....n1033
Paving (Baltimore) recorded by map and file system (R. K. Compton).....*865
Philadelphia, city planning n1034
Proposes new loan bill.....n1034
Zoning proposed for..... 918
Public improvement programs hampered by local authorities e250
Seattle advances wages..... p46
Should they take risks in water filtration and sewage treatment?.....e909
Special legislation for, how ban is avoided in Kansas..... 573
St. Louis zoning ordinance, amendments (H. Bartholomew) 403
St. Paul increases tax limit..... a99
St. Paul municipal savings bank..... 407
Tallahassee, Fla., to have manager....n836
Three planning commissions in Pittsburgh 763
Transit developments e105

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Washington, D. C., bill to limit height of buildings, etc., and zoning, passed by House n584
Wheeling, W. Va., begins civic development n486
Zoning authorized in Oregon 498
Zoning for Washington n339
Zoning ordinance, Newark, N. J. ..n1033, 1045
Zoning ordinance, St. Louis, amendments (H. Bartholomew) 403
Zoning proposed for Philadelphia 918
City Managers' Association, date of meeting advanced n680
Civil engineering and public health (R. J. Harding 920
Civil Service examinations 46, 101, 149, 199, 246, 293, 341, 394, 444, 488, 536, 586, 634, 681, 842, 905, 970, 1035, 1082
Clamshell bucket digs 30 cu.yd. per dip.. *279
Operated by gears completely inclosed. n*636
Clay, soft, resistance to penetration by pyramids and piles 946
Cleveland orders bond issue vote on subway n836
Public-works engineering in—impressions here and there 996
Sliding hillside at *164
Street-car loop subways e105, e154, *170
Clinton, Mass., washing sewage-filter gravel at 763
Closet, dry, folding portable h*146
Sanitary, with septic tank h*97

COAL, COAL MINES, COAL STRIKE

Builders press priority claims n902
Coal and construction materials e781
Constructors continue plea n966
Mines taken over by Kansas n745
Restrictions protested by builders' committee n835
Strike e685, n745, e781, n835
And water power e973
Kansas Highway Commission aids in emergency n1031
Tractor engine operates plant during crisis n*1036
Coast and Geodetic Survey, mapmaking work n341
Cock box, curb, and water meter, combined. 1084
Cofferdam experience at bridge in Chicago River (H. E. Young and W. A. Mulcahy) e249, *268
Thin-wall, new type *817
Coffer plates made from old boiler plates (G. W. McAlpin) h900
Colombia, S. A., American contractors invited to bid on tunnel n969
Colorado slow in putting license law into action n779
Colorado Engineering Council working ... 284
Colorado Society of Engineers keeps members in employment 579
Columbia Basin Survey Commission completing irrigation surveys n714, 800

COLUMBUS, OHIO

Columbus, Ohio, board of consulting engineers for 1073
Engineers' Club asks information on organization to increase pay (D. T. Wadsworth) ..... letter 286
Flood protection work, concrete wall construction is continuous process *454
Garbage-reduction results 1067
Proposed water-works enlargements 885
Widened channel reduces hazard *512
Columns, steel, further tests e202
Comfort station law in Wisconsin 121
Common professional program ..e782, 808, n835
Compressed air used to clean road surface before oiling (Maj. W. A. Welch) *933
Compressed-air line anchored to concrete posts h963
Compressed Gas Manufacturers' Association to meet n972
"Compression" wood and failure of factory roof-beam (G. E. Heck) *508
Compton, R. K., on Baltimore paving recorded by map and file system *865
Computing cross-section paper for earthwork computations (J. H. Dorroh) letter 39, (L. C. Craig) letter 240
Comyn, W. L., receives medal for building first concrete ship n42, n*100

CONCRETE

Aggregates:
Burnt clay and wood 703
Clean, insured by carpet of screenings h676
Gravel deposits for, explored by suction pumps h532
Slag, in England 315
American Concrete Institute convention .. n41
Backfilling tunnel through holes bored from surface (J. Armstrong) *174
Beams, diagram for locating stirrups in (M. J. Lorente) *310
Bonding new to old 209
Building, addition made at reasonable cost *75
Concreting procedure on Miami flood-control dams *640
Excess water in cement glue ....e105, (C. T. Wiskocil) *130
Fireproofing columns with plates a92
Forms:
Bottom carries ginpole to erect top form h242
Floor, designed for easy stripping. h*195
Universal, for skew culvert ends (S. P. Baird) h*901
Gravel, does not make concrete fire-resistant e49, a76
Jigging, vibration and pressure, effect on concrete a16

Page

Lightning pushes sidewalk off concrete bridge *68
Lining reservoir with concrete with cement gun (E. C. Eaton) *167
Materials chuted into sidewalk-vault mixing plants h40
Mixers and Mixing:
Gage glass on barrel measures water h*773
Materials chuted into sidewalk-vault plants h40
Labor saved by resource of contractor (W. F. Reichardt) h*712
Large mixer puts in 180-yd. pavement slab every hour *658
Portable made from oil drum (A. J. Beckwith) h*531
Traveling plant concretes wall h*145
Mortar test for, more against (J. O. Jones) ..... letter 581
Pressure, vibration and jigging, effect on concrete a16
Proportioning, see also Concrete, Tests:
Defends aggregate grading theories (L. N. Edwards) letter 191, (G. M. Williams and W. Davis) letter 334
Excess water in cement glue ....e105, (C. T. Wiskocil) *130
Ratio of fine to coarse aggregate a92
Water-ratio as affected by rodding (D. A. Abrams) ..... letter 895
Quick-hardening with special cements ... a16
Rapid concreting a feature of big Portsmouth dry dock *494
Reinforced:
Columns reinforced with cast-iron tubes 521
Tests on properties (W. A. Slater) *217
Rich, in roads; does it crack more than lean? (J. C. Pearson, W. D. Uhler, E. N. Hines, P. S. Wilson, A. N. Johnson, C. Older, D. A. Abrams, A. H. Hinkle, e491, 518, (B. H. Tong), letter 771
Rodding concrete, further researches in (F. E. Giesecke) ..... letter *528
Rough field tests for concrete sands ... 424
Ship, French tests 821
Ships, see Ships, Concrete
Slag, in England 315
Stress, repeated e449
Striking off, on superelevated curves .. h*289
Tests; see also Concrete, Proportioning:
Columns reinforced with cast-iron tubes 521
Escaping water important (G. A. Parkinson, D. A. Abrams and J. C. Pearson) ..... letters 192
French, for ships 821
In tension (T. H. Carver and J. H. Quense) *1005
Making gravel concrete fire-resistant, ... e49, a76
Mortar, for concrete, more against (J. O. Jones) ..... letter 581
Paper cylinders used for molds (W. Davis) *473
Properties of reinforced concrete (W. A. Slater) *217
Quick-hardening concrete with special cements a16
Ratio of fine to coarse aggregate a92
Vibration, pressure and jigging a16
Used in boiler-house structure and fittings (G. S. Nobles) *262
Used to jacket historic cast-iron bridges. 134
Vibration, pressure and jigging, effect on concrete a16
Concrete beams, standard sizes wanted .. e910
Concrete blocks, yard for casting cheaply improvised from old equipment *356
Concrete buildings, large, at stockyards, Denver *413
Concrete channel for steam over fractured mine outcrop (H. A. Coy) *327
Concrete conduit for railway track wires *1055
Concrete flagpole poured in place (R. C. Hardman) *173
Concrete floors, depressed permanent bench marks (L. C. Scott) *365
Concrete I-beams used to make crib retaining wall *651
Concrete mast 164 feet high built in place. 952
Concrete pipe and culverts, joint committee organized n98
Concrete pipe fails from unequal expansion of shell (Prof. G. E. P. Smith) *113
Concrete posts, hollow, packed with sand .. *269
Concrete railway track support ....165, (A. C. Irwin) letter 333
Concrete tanks for oil storage a16
Concrete tower, 140-foot, for concreting raised in one piece (S. S. Hammel) ...h*242
Concrete wall construction is continuous process *454
Concreting procedure on Miami flood-control dams *640
Concreting scroll case; curved pipe prevents air pockets (R. C. Hardman) h*963
Conduit, brick, water, gives long service .. 768
Conduit, concrete, for railway track wires *1055
Congressional persecution of contractors and manufacturers (W. B. King) 1044
Connecticut Association of Members of Am. Soc. C. E. formed n634

CONSTRUCTION

Labor ..... e397, instability, 759, 813, 876
New methods in subway work under Philadelphia City Hall e297, *300
Power costs cut by electricity *211
Work, largest use of electric power on e417

CONSTRUCTION CAMPS

Camp beds and bedding reduce labor turnover (W. C. Ruegnitz) e202, 213
Folding portable dry closet h*146
Sanitary closet with septic tank h*97

Page

Constructors' vs. designers' pay e539
Constructors continue coal plea n966
Consulting Engineers' council protests to President against Plumb plan *405
Continuous girders, mechanical method for determining reactions in (R. Fleming) .. *428

CONTRACTORS AND CONTRACTING; see also CONTRACTS

American, invited to bid on Colombian tunnel n969
And engineers, coöperation e249
Appropriation asked for relief of n681
Associated General Contractors of America organize subsidiary, Contractors' Service Corporation n485
Plan highway conference n715
Set dues n837
To be represented by C. A. Crane .. n394
Canadian gets Turkey Creek sewer, Kansas City, Mo., contract n535
Cincinnati, join national body n1077
Congressional persecution of (W. B. King) 1044
Equipment, charging off, depreciation on h582
Government, relief sought n392
Large, shun road work (Practical Engineer) letter 38, e49, (W. J. Hoskyn) letter 284, (L. B. Smith) letter 480 e637
Pay for estimates, say contractors 619
Refuse to bid save on cost-plus basis ...n534
Service Corporation formed n485
Specifications, responsibility for (W. P. Bullock) ..... letter 388
Texas Association n99
Tool records kept on two form sheets. h*675

CONTRACTS; see also CONTRACTING and CONTRACTORS

Bonds, corporate contract, function of (E. W. Bush) ..... letter 142
Bonds, criticism of business answered (H. V. Swart) 669
"Contract Forms and Specifications," Miami Conservancy District (book review) 380
Cost of bonds on War Department construction contracts in dispute n99
Government specifications should not misplace responsibility (E. D. Buel) letter, 144; (S. W. Barakat), letter... 285
Highway, long, in Arkansas 87
"Law of Government Contracts" (book review) 380
Overhead exceeds cost plus 10 per cent e50, (A. P. Roscoe) 89
Convict labor on Arizona highways 88
Coolidge, Governor of Massachusetts, re-elected e685
Copper, effect in reducing corrosion of steel a14
Corps of Engineers, see Army, U. S. A. Corps of Engineers
Corpus Christi, Tex., tidal storm and effect on engineering structure (T. Bartlett) ..*848
Cost of living, effect of production shown graphically n443
Costello, J. W., on Newark, N. J., garbage feeding contract 456

COSTS

Cost engineering as a science e250, *252
Keeping costs of building government houses (J. C. Prior and H. P. Green) e250, *252
Overhead exceeds cost plus 10 per cent e50, (A. P. Roscoe) 89
Coy, H. A., on concrete channel for stream over fractured mine outcrop *327
Crandell, J. S., on corrugated spacer for wood-block pavements *463
Crane, C. A., to represent Associated General Contractors n394

CRANES

Heavy double trestle for shipbuilding (R. W. Burpee) e717, e718, *723
Semi-portal dock, at Boston Army base wharf *516
Track-laying tractor crane of ordnance department n*396
Traveling, safety in operation 471
Creosote oil specifications declared "closed" by Chicago court n1080
Creosoted piles sound after 29 years *378
Creosoted timber tanks and poles damaged by woodpeckers (L. W. Duffee) ....letter 962
Crib retaining wall, concrete I-beams used to make *651
Cribbing protects banks of Yakima River.. 624
Cribs, wood, hold toe of riprap on slopes. h*899
Critical hour, the e685
Cross-section paper, computing, for earthwork computation (J. H. Dorroh) letter *39, (L. C. Craig) letter 240
Cross-sections, exaggerated, measured by planimeter (C. P. Mowry) ..... letter *436
Crown, V. M., on leakage test of wood-stave pipe line *264
Culvert for drainage, built through high railway fill *645
Surveys, Iowa 140
Universal form for skew culvert ends (S. P. Baird) h901
Curb cock box and water meter, combined. 1084
Curb protects stock pile in street h628
Curtis, G. A., on screeding easements of banked highway curves *274
Curve chart for railway resurvey (J. G. Wetherell) *506
Curved drive for automobiles in six-story garage *188
Curves, short-radius, convenient table for locating (C. M. Pritchett) h1076

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Curves and tables, mechanical device for reading *644
Cutting granite with oxyacetylene flame. h*390
Cylindrical structures, wind pressures on (R. W. Fleming)..e491, 409, connection 659

D

Dabney, A. L., on what will engineers pay to improve their status? 720

DAMS

American Falls project, Idaho, demanded ....e718; (B. Dibble) letter 1070
Closing construction openings 377
Closure risks e845
Concreting procedure on Miami flood-control dams *640
Earth, constructed by means of large use of machinery (F. E. Winsor) 612
Foundation placed by suspended pneumatic caissons *108
Hay used to line slopes 378
Headgates combined with bridge over aqueduct canal *610
Hetch Hetchy, new, to be one of world's highest n244, bid accepted n292
High Falls, Ont., foundation placed by suspended pneumatic caissons *108
Hydraulic dam cores, study of pressure in e1037, *1040, e1038
Hydraulic-fill, consistency of cores tested by three methods e345, *708
Hydraulic-fill construction e345, *371
Hydraulicking embankment e345, *371
Jackson Lake the savior of Snake River valley *992
Lower Otay failure called by court "act of God" n340
Multiple-arch fundamentals in design (R. P. McIntosh) e447, *464
Rensselaer Lake, without spillway 713
Supported by bascule bridge closes canal lock *116

Daniels, Secretary, dedicates Pearl Harbor dry dock n486
Dappert family, of Taylorville, Ill., war record n148
Davis, A. P., selected by nominating committee as president Am. Soc. C.E. n714
Davis, W., on paper cylinders used for molds for concrete test pieces *473
Daylight saving continued n148, repeal again up, n290; passed over veto n394
Dean, F. W., review of "Timber" 577
Deepest mine is Michigan Tamarack shaft. 403
Deflection of continuous beams and rigid frames (F. E. Richart) *564
Delaware, annual highway meeting and exhibit n841
Delaware, Lackawanna & Western R.R. trainshed raised without traffic interruption *460
Denison, E. E., on analysis of Esch railway bill 885
Denver, large concrete building at stockyards *413
Water-works, permanent plants for chloramine installed *606
Department of health, state, essential functions of 1002

DEPARTMENT OF PUBLIC WORKS

Bills introduced n41
Chamber of Commerce committee on ..n1031
Construction Division, U. S. A., should be made part of proposed department .n968
Discussed by Am. Soc. C. E. n630
In other countries n245
Indorsed by Engineers' Club of Minneapolis n836
Jones-Reavis bill n149; supported by A. A. E., n585; certain points of, n585; engineers urge commercial bodies to indorse *967
National Public Works Department Association n1030
Need for, seen in work of Coast and Geodetic Survey n341
Need for seen in treatment of rivers by Government n198
Versus Corps of Engineers (I. Randolph) 561, (I. Randolph) letter 770, correction 771

Derrick, improvised hoisting, tilts steel stack onto base h*337
Erection, straddles site of narrow building h*900
Operates light piledriver without extra engine (F. W. Epps) h*963
Design records for operating force h*963
Des Moines, manager for water-works to be selected e539
Detroit, bridge across American channel authorized by United States Senate; plans for, n904; project studied, n969
Downtown street-car subways proposed. n678
Milk hauled into city by motor trucks. 758
Street-car terminal subways approved. n714
Development committees' conferees meet . e345
Device, mechanical, for reading curves and tables *644

DIAGRAMS

Adaptation of rational method of storm-water drain design (H. G. McGee)... *868
Computing band spacing for wood-stave pipe (W. T. Batcheller) *472
Drought, method of constructing (P. V. Tchikoff) *554
Excess loss of head in pipe lines (F. S. Bailey) *162
Reactions and bending moments of beams (R. Burnham) *956
Stirrups in concrete beams, locating (M. J. Lorente) *310
Diaphragms damp water-gage fluctuations. 613

Page

Dikes, steel spur, for shore protection. . . *410
Dishpans used for light reflectors (A. S. Fry) h195
Distance barriers broken down e638
Ditches, railway, cost of 700
Dock caisson gate, 400-ton, lowering with sand jacks (G. W. Plaisted) *886
Dollar, changes in value *937
Doman, R. S., on engineering and construction prospects in Roumania 925
Douglas fir, long-used and freshly cut, strength compared 281
Drafting and draftsmen, rules for drafting practice 121
Union, Federal Employees' Union and strike methods (H. F. Robinson) .letter 143
Drag, special, finishes channel slopes dug by dragline excavator (B. L. Zull) h*96
Dragline crosses Rio Grande on cable pontoon bridge h*1074
Dragline excavator helps itself to fuel and lays track over soft ground (J. E. Burkholder) h*582, h*1074
Lowers water main h*146
Draglines, oil-driven; radiators outside secure cooler air and save space h*440
Steam and electric compared 722

DRAINAGE

And Federal aid e1038
And flood protection at East St. Louis, Ill. *814
Culvert built through high railway fill. . *645
Doing hardest work by force account keeps prices down (A. S. Fry) h*40
English act of 1918 462
Irrigated land in Yakima County, Wash. ington 984
Kutter's roughness in ditch, determination of (R. Bosard) *921
Land values raised by 881
Maintenance of systems e718
National Drainage Congress n839
New York State swamp drainage amendment vote n1081
Nondrainage of irrigated lands causes malaria 207
Sinking long board mattress in narrow channel *230
State and Federal control needed (A. M. Shaw) 523
Wisconsin's new laws 1066
Works of Rio Grande irrigation project (J. L. Burkholder) *543
Drawbridges, see Bridges, Drawbridges.

DREDGES AND DREDGING

Clamshell bucket digs 30 cu.yd. per dip. *279
Hydraulic removes material under piers by jetting (R. W. Beuttenmuller) ..h*774
Orange-peel buckets repaired without costly delays h*391
Scows to be emptied let down Niagara River on lines h*1075
Drill, land, on barge, drills test hole in tidewater (A. J. Newman) h*899
Driller-crusher-tractor needed (S. H. Lea)
Drive, curved, for automobiles in six-story garage ..... letter 962
Droughts, probable, method of constructing diagram to show (V. V. Tchikoff) *188
Drums, spiral, for operation of timber lift spans *554
Dry closet, folding portable *803
Dry dock, Pearl Harbor, Hawaii, dedicated. n486
Pearl Harbor, pump well large precast unit (R. W. Gaylord) h*146
Portsmouth, Va., rapid concreting a feature of construction *861
Duckering, Capt. W. E. on problem method at Army Engineer School *494
Duluth Engineers' Club, assignment to committees 183
Questions members concerning legislation 1069
Dumping fixed-box motor trucks, improvised method 93
Duplex strainer for water or oil h*676
Dust in atmospheric standard method of determining n344
Dutch East Indies, construction opportunities in (J. W. Evans) 936
Dynamite, 40%, not as strong as TNT. . . . 497
..... h145

E

Earnshaw, H. P. J., on traction steam shovel crosses railroad bridge h*773
Earth slips prove disastrous to open-cut sewers h*773
Earth problems studied n989
Earthwork, computing cross-section paper for (J. H. Dorroh) letter *39, (L. C. Craig) letter *39, (L. C. Craig) ..... letter 240
Computing with planimeter (L. C. Craig)
East St. Louis, Ill., flood protection and drainage at ..... letter 240
Eastern Ontario Hydro-Electric Municipal Union formed *814
Eastman, F. H., on telescopic foundation caissons sunk in bank basement n970
Eaton, E. C., on construction details of Lindsay-Strathmore Irrigation District, California *348; operating methods and results *369
On lining reservoir with concrete by cement gun 474
..... *167

ECONOMICS

Changed dollar and the engineer. . *182, e201
Changes in value of dollar *937
Deferred earnings, effect on capital value (J. R. Bibbin) *937
Effect of production on living cost graphically shown n443

Page

Personal element, the (P. B. McDonald). P
Production and patience ..... e
Edgewood Arsenal, Maryland, narrow-gage railway operation (Lieut. J. A. Silsbee). 1

EDUCATION

Aims of engineering schools ..... e
American Society of Mechanical Engineers recommends new by-laws for student branches ..... n
Asphalt, lectures on, at colleges ..... n
Business training for engineer (A. Marston) ..... e153, 183; (J. K. Finch) ..
Capitalizing engineering urge 1
"Case system," changes in engineering curricula and business training for engineers (C. F. Allen, Maj. C. C. More and Capt. W. E. Duckering, G. C. Anthony, J. C. Tracy, A. A. Potter, A. Marston) e153, 183; (J. K. Finch) ..
Conference in Washington ..... letter
Economic and business training for engineers ..... n
Engineer Training Camps should be continued ..... n
Engineering fundamentals for four-year course (W. G. Raymond) e153
Harvard Engineering School, aims expressed by President Lowell ..... letter
Highway engineering courses investigated by Asphalt Association ..... e
Highway engineering fellowships offered by University of Michigan ..... n
Highway engineering, suggested course in (R. T. Brown) ..... n
Kansas State Agricultural College, modifications in engineering at (A. A. Potter) ..... letter
Lowell, A. L., views on aims of engineering schools 186
Massachusetts Institute of Technology contracts with industries ..... e
Minnesota University to correlate schools of chemistry and engineering ..... n
Plight of the colleges ..... n
Progress in ..... e
Reaction in engineering education (J. K. Finch) ..... e3, n
Salaries for technical instructors (C. H. Fuller) ..... letter
Training School at Camp A. A. Humphreys (G. C. Anthony) ..... n
Tufts College engineering school, changes at ..... n
University of Illinois, salaries of instructors criticized (C. H. Fuller) letter
Yale, reorganization at (J. C. Tracy). . .
Edwards, H. H., on tests of thin-base monolithic-brick road 207
Electric generating plants in Canada *134
Electric hoists pull 3000-ton building 450 feet *706
Electric mucking machine used on Hetch Hetchy tunnels 996
Electric power, high-tension transmission lines for Spain 352
On construction work, largest use *417
Output 549
Electric railway as freight carrier (W. Jackson) ..... letter 434
Electricity cuts construction-plant power costs *311
Electrolysis, American Committee on, resumes work n970
In underground structures 798
Elevator, stacking, simplifies freight handling *855
Emergency Fleet Corporation equipment and supplies selling plan n100
Emigration exaggerated e685
Employment Bureau, Joint, report on. . . . e974, (E. B. Miller) letter 1025
Employment bureaus, 98, 147, 196, 243, 290, 339, 392, 441, 485, 533, 583, 630, 678
Employment bureaus, society and private (S. Newbury) ..... letter 831
Endless-track arrangement for carrying away at steam shovels (D. J. McFadden h*484
Engineer casualties third highest in war. . 576
Engineer Training Camps should be continued e153
"Engineering aristocracy" blamed for present status of technical men (J. L. Harrison) 1071
Engineering, civil and public health (R. J. Harding) 920
Engineering records, important; data on repairs e639
Engineering, safety, reduces cost of construction 864

ENGINEERING COUNCIL

Classification of state, county and municipal salaries and positions *352
Committee drafts model registration law n746
Committee indorses plan for national budget n714
Difficulty in raising funds for Washington office e492
Elected to membership in Chamber of Commerce of United States n714
Makes direct appeal for funds n967
Suggests conference on coördination of Government map-making n714
Urges appointment of engineer to Interstate Commerce Commission n442
Engineering Institute of Canada, fifth professional meeting n631
New life in 823

ENGINEERING NEWS-RECORD

Combined issues e781
History and staff 1
Printers' strike ended e749
Resumes publication e637

*, illustrated; e, editorials; h, hints; n, news notes; s, abstracts.

Page

Engineering Standards Committee, proposed reorganization e106
Proposes new constitution 579
Engineering urge, capitalizing e911

ENGINEERS

American kindness appreciated by visitor from New Zealand (W. E. Bush) letter 239
And contractors, coöperation 249
And investment securities e1038
As others see them e345
(M. O. Leighton) ..... letter 387
(R. Hering) ..... letter 525
British municipal engineer, problems of. 1006
Business training for (A. Marston) 187
Constructors' vs. designers' pay e539
(W. E. Brown) ..... letter 674
Consulting, board of, for Columbus, Ohio 1073
Consulting, getting retainers e447
Coöperation or competition among? (C. E. Drayer) ..... letter 479
Cost of living *182, e201
County engineers replace county surveyors in California n197
Designing, prepare atlases and operating plans e539
(W. E. Brown) ..... letter 674
Dropped from San Francisco payroll ... n585
Education and compensation (A. Hinrichs) ..... letter 386
"Engineering aristocracy" blamed for present status of technical men (J. L. Harrison) ..... letter 1071
Examining, see Engineers, Licensing
For Interstate Commerce Commission urged by Engineering Council n442
French consulting (E. McCullough) letter 142
French visit America n98
Government, forced out of service by small salaries n903
Eastern engineers proficient e1037
Highway, salary schedule proposed by A. A. E. committee 677
Highway, work in France (C. M. Buck) letter, with editorial comment, 39
Hints on applying for a job by letter (R. T. Brown) ..... letter 770
India to unite in single society n*840; dues e909
Influence on public affairs, lack of n149
Interstate Commerce Commission, to be released n339
Joint Conference Committee's report on unification n835
Licensing:
Colorado slow in putting law into action n779
Engineering Council committee drafts model law n746
Idaho law n293
Illinois architects' license law n243
Illinois surveyors' license law n441
Institution of Civil Engineers favors registration n836
Institution of Civil Engineers may regulate British practice n442
Iowa board appointed n631
Iowa, dates set for registration n1082
Iowa engineers must register n1033
Michigan board n967
Michigan law 697
Model laws e846
New Jersey county engineers demand greater recognition n681
Oregon board organized n533
Oregon registration begins n631
Regulate profession by law (F. E. Chesley) ..... letter 238
Surveyors licensed in Texas 315
More authority for (F. A. Churchill ..... letter 37
(Practical Engineer) ..... letter 38, e49
Office arrangement (H. P. Farrow) ... *502
Oregon, oppose union label on plans .. n779
Organization of profession e448
Pay, see also Engineers, Unionization:
Actual case shows something wrong (W. S. Harvey) ..... letter 143
American Association of Engineers' committee n101
And education (A. Hinrichs) 386
Baltimore and Cincinnati urged to increase pay by local chapters A. A. E. n714
Canadian ratings criticized n486
Chicago city engineers get increase .. n292
Classification of state, county and municipal salaries and positions, by Engineering Council *352
"Common surveying" and engineers' unrest (C. T. Johnson) ..... letter 94
Discussed by American Society of Civil Engineers n745
Economic side of profession (E. R. Taylor) ..... letter 388
Engineers' Club, Columbus, Ohio, asks information on organization to increase pay (D. T. Wadsworth) letter 286
Engineers have long been underpaid (P. M. Fogg) ..... letter 193
Federal salaries, reclassification .. e590, 622
Government engineers forced out of service by small salaries n903
Highway engineers schedule proposed by A. A. E. committee 677, n714
New York City increases municipal engineers' pay n837
New York Union of Technical Men demand increase, supported by New York chapter, A. A. E. n486
Railroad engineers get increase n293
Railroad engineers', considered by Board of Wages n585
Salary diagrams in college catalogs (G. H. Ellis) ..... letter 387
Salaries for technical instructors (C. N. Fuller) ..... letter 435

Page

Seattle engineers protest against municipal engineers' pay n631
St. Louis municipal engineers get increase n1033
State and municipal engineers, pay and classification n340
Status of engineers, Association of Ohio Technical Societies on 671
Stop college supply of engineers (F. N. Harris) ..... letter 141
(F. E. Chesley) ..... letter 238
(M. E. Cooley) ..... letter 433
(T. J. Brennan, M. E. Cooley, J. C. Parker, H. E. Riggs, H. C. Anderson, A. H. White, E. M. Bragg, ... letters 625
Plans, Ownership of 365
Professional obligations ("Simultaneous") ..... letter 828
Public and the engineer (C. Hansel) ... 646
Public-works, status should be changed (F. A. Churchill) ..... letter 37, e49
Registration: see Engineers, Licensing
Responsibility for specifications (W. P. Bullock) ..... letter 388
Retainers, getting e447
Sanitary, as health officers (E. G. Sheibley) ..... letter 526
with editorial comment 526
Should study legislative bills e105
State and municipal classification and pay n340
State, right to practice 365
Status of engineers, Association of Ohio Technical Societies on 671
Status, present, blamed on "engineering aristocracy" (J. L. Harrison) .. letter 1071
Stop college supply (F. N. Harris) letter 141
(F. E. Chesley) ..... letter 238
(M. E. Cooley) ..... letter 433
(T. J. Brennan, M. E. Cooley, J. C. Parker, H. E. Riggs, H. C. Anderson, A. H. White, E. M. Bragg) ..... letters 625
Teach doctrine of designed roads in Iowa. 953
Technical writing, how may young engineers receive training in? (J. W. Moulton) letter, with editorial comment 433; (A Writer), letter 526
Three openings to one graduate, (F. N. Harris) ..... letter 141
(F. E. Chesley) ..... letter 238
(M. E. Cooley) ..... letter 433
(T. J. Brennan, M. F. Cooley, J. C. Parker, H. E. Riggs, H. C. Anderson, A. H. White, E. M. Bragg) ..... letters 625
Union—not confederacy—future strength of profession (H. B. Smith) ... letter 1024
Unionization: see also Engineers Pay:
Activities of "Engineers' Union, Local No. 1" visualized by correspondent (H. Berlin) 386
Chicago technical employees hear union labor leaders n1081
Federal Employees' union and strike methods (H. F. Robinson) .... letter 143
Movement to unionize all New York City municipal employees n631
Rapid Transit Engineers' Association, New York, votes for n147
Stop college supply of engineers (see under Engineers, Pay)
What will engineers pay to improve their status? e492; (F. Lavis and others) 729, (K. P. Armstrong) letter 984, (H. V. Knouse and J. Ross) letters 960; (E. T. Cranch) letter 1070
Why engineers are not appreciated 125
(R. E. Spear) ..... letter 433
Wilmington, Del., chooses engineer for memorial bridge by competition *806

Engineers, Architects and Engineers' Conference on National Public Works, committee chairman, etc. n149
Contributions from n149, n198, n245, n341, n585
Now National Public Works Department Association n1030
Engineers' Club, New York, damaged by fire n1031
Epps, F. W., on light piledriver operated by derrick without extra engine h*963
On through concrete arch bridge to give large waterway *994
Errors, common, in detailing steelwork for buildings. (E. Godfrey) *730
Estimates should be paid for, say contractors 619
Evans J. W., on construction opportunities in Dutch East Indies 497
Excavation, channel slopes finished by special drag (B. L. Zull) h*96
Dragline excavator helps itself to fuel and lays track over soft ground (J. E. Burkholder) h*582
Excavator, Dragline, lowers water main .h*146
Explosives, blasting tests show TNT stronger than 40% dynamite h145
Exports, see Trade, Foreign
Extensometer, mirror, for testing wires .. a*32

F

Factories, war, to be sold by War Department n197
Factory wastes, control over, in Wisconsin. 159
Fairbanks district, Alaska, gold yield 854
Farmers, where they stand on affiliation with union labor e717
Farrin, Capt. J. M., on bridging Rhine by American Army engineers *118
Farrow, H. P., on arrangement of engineer's office *502
Federal Employees' Union and strike methods (H. F. Robinson) ..... letter 143

Page

Federal Highway Council, New York Council organized n244
Federal Highway Council takes up Highway Transport Committee's work n680
"Field Engineering," Searles', error in field tables (A. Llano) ..... letter 962
Field tables, error in Searles' "Field Engineering" (A. Llano) ..... letter 962
File for prints made from rack (C. P. Rumpf h*531
Fill, construction railway, made by caterpillar steam shovel h*1028
Filling concrete ties hold together walls of bridge-approach fill *522
Filters, drifting-sand, results at Toronto (N. J. Howard) a*822
Fireproofing concrete columns with plates a92
Fire-resisting metal lath to be tested n636

FIRES

Forest, detected by air patrols 120
Gasoline, damages Pennsylvania R. R. tunnel 110
Hazards in storage of fuel oil (J. W. Lord) a*415
Losses in United States 456
Oil tank, menaces Brooklyn n583
Flag-pole, concrete, poured in place (R. C. Hardman) *173
Flanging machine, for thin steel plates, built on job h*628
Flat-car cement stock pile for paving mixer h*1076
Flat roof or groined arches for concrete reservoirs 566
Fleming, R., on bolts in field connections of steel-frame buildings e298, *316
On mechanical method for determining reactions in continuous girders *428
On two home-made bridges in Catskill village *568
On wind pressures and wind stresses in tower design *660
On wind pressures on cylindrical structures ..... e491, 499, correction 659
Floats show course of river currents *119
Floodgates proposed for control of Savannah River (E. C. Garvin) *873

FLOODS AND FLOOD PREVENTION

Carried past broken ground by concrete channel (H. A. Coy) *327
Columbus, Ohio, widened channel reduces hazard *512
First valley closure of Miami protection system completed e845, 853
Flood works, special targets facilitate survey of (R. C. Chaney) *768
Galveston, Sept. 14 ..... n585, n630
Lower, Rio Grande in New Mexico and Texas (A. J. Henry) 1001
Palo Verde District levee work ..... n 44
Protection and drainage at East St. Louis, Ill. *814
Floor, tile and concrete flat-slab being tested 933
Food products, better distribution wanted.. e49
Force account, doing hardest work by, keeps prices down (A. S. Fry) h*40
Foreign Trade, see Trade, Foreign
Forest fire service, standard lookout house *432
Forest fires, air patrols to detect 120
Forest protection and timber supply e492
Forest Service, highway work handicapped n393
Forests, national, roads in n291
Forest Products Laboratory gets Chicago support n46
Formula, Johnson's, broader use of, for repeated stresses (Prof. J. B. Kommers) *942

FOUNDATIONS

Cofferdam experience, Chicago River bridge (H. E. Young and W. A. Mulcahy) e249, *268
In quicksand and watery gravel *414
Pile foundations for unequal load distribution (E. P. Arneson) *698
Sandy, at arch bridge pier tested (A. Richards *208
Telescopic foundation caissons sunk in bank basement (F. H. Eastman *369
Work, care in e249, *268
Founder societies and American Association of Engineers n966
Frames, rigid, and continuous beams, deflection of (F. E. Richart) *564

FRANCE

High prices of engineering materials... 275
House rebuilding let to G. Vannier, Canadian architect n149
Housing contract for MacArthur Bros. Co. n393
Low wages in e688
Lumber order for house construction being placed n485
Railways light, Army's practice (P. McGeehan) *653
Reconstruction, a new view of e885

FREIGHT

Electric railway as freight carrier (W. Jackson) ..... letter 434
Elevator, stacking, simplifies handling.. *855
Handling at Brooklyn Army base e540, *555
New pier handling methods at New York, consideration asked n680
Pier design discussed by New York Chapter, A. A. E. n777
Terminal design a traffic problem. e540, *555
Terminal, small river for widely varying water stages (H. Abbott) *998

* illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Transportation by motor truck or railway e2, e50, (C. W. Baker) 52, (W. Jackson) ..... letter 434
Freights, ocean, reasons for high 991
French engineers visit America n98
Fritch, L. C., on Congress and railways' future 17
Fry, A. S., on dishpans used for light reflectors h195
On doing hardest work by force account keeps prices down h*40
On keeping scrap cleaned up saves money h390
On lost time reduced by shifting crews.. h145
Fuel oil, fire hazards in storage (J. W. Lord) a415
Tank, concrete, design and construction. a322
Fulton, T. D., on extraordinary repairs to 1900-ton draw-bridge *366, e398

G

Gage glass on barrel measures water for concrete h*773
Gages, wagon and street-railway 328
Galveston flood, September, 1919 ..n585, n630
Sea-wall, extending (J. B. Lippincott).. *617
Sea-wall protects city from storm..... n*715

GARBAGE

Buffalo sells garbage on Chicago hog-price bases n197
Collection and disposal at Akron, Ohio (F. C. Tolles) 1013
Collection and disposal, Utica, N. Y.... *810
Columbus, Ohio, reduction results 1067
Feeding to hogs and sheep at Utica, N. Y. *810
Newark, N. J., feeding contract 456
Reduction results, Columbus, Ohio.... 1067
St. Louis disposal n243
Unloaded from trailers by net and pole.. 454
Garvin, E. C., on protecting banks of Savannah River through Augusta.... *410
On floodgates proposed for control of Savannah River *873
Gas and aircraft warfare e591
Gas producers at small water-works station 462
Gas waste, treatment of, to prevent water pollution (E. J. Tully) *917
Gasoline tax for road funds 916
Gaylord, R. W., on Pearl Harbor dry dock pump well large precast unit..... *861
Geiston, W. R., on water-works operating problems in Quincy, Ill. 1019
General Contractors' Association and Associated General Contctors of America to consolidate publications n680
Geological Survey creates West Indian division n148
Loses engineers through small salaries..n903
Work, calculating machines in *422
Work 984
Germany increasing production e540
Methods used in overcoming tire shortage (H. M. Kistler) *701
Trade resumed with n151
Gibbs, Col. E. A., on safety in steel erection a801
Gifford, F. J., nominated for secretary New England Waterworks Association n744
Girder expansion bearing fails to slide... 652
Girders, continuous, mechanical methods for determining reactions in (R. Fleming).. *428
Glaettli, J., on some problems in design of concrete ships a273
Glass, E. E., on small leaks are large losses.h964
On turnbuckle adjustment for hammer clutch h899
Godfrey, E., on common errors in detailing steel work for buildings. *730; (L. C. Jordan) letter 961; (G. Paaswell) letter 962
Goiter, relation between water-supply and goiter *516
Gold yield, Fairbanks district, Alaska..... 854
Gompers, S., returns from Europe, silent on Plumb plan, talks of labor and European conditions n486
Goodrich, R. D., on another diagram for solving Manning hydraulic formula.... *648
Goss, O. P. M., dedicates wood-perforating patent to public n1082
Government property, Bridgeport District Salvage Board issues weekly bulletin..n149
Government specifications should not misplace responsibility (E. D. Buel) letter 144
(S. W. Barakat) letter 285
Gow, C. W., receives Wason medal..... n42
Grade-crossings, see Railways, Grade Crossings
Grain-elevator accident at Port Colborne Canadian Government appoints board of engineers to investigate n442
Grain elevators, North Dakota will build.. n46
Grand Trunk Railway, opposition to purchase by Canadian Government...n715, n745
Grange, National, on public highways n835
Granite-cut with oxyacetylene flame.... h*390
Gravel and sand produced in 1918..... 867
Gravel deposits for concrete aggregate explored by suction pumps..... h532
Hauled with caterpillar tractor in Minnesota *227
Grease, recovery from sewage sludge..e910, n948
Green, H. P., and J. C. Prior, on keeping costs of building Government houses.. e250, *252
Greene, F. S., on high cost of maintenance of light macadam highways e346, 353
Groined arches or flat roof for concrete reservoirs 566
Grove, W. G., on design features and methods of 540-foot suspension bridge.. *4
(D. Ording and W. G. Grove) .... letters 527
(D. Ording) ..... letters 711
Gunny bale handling, by elevator, at Seattle *855
Gypsum, structural, tests on..... 852

H

Page

Hacker, T. W., on submerged pipe-laying in shallow water h*964
Hammel, S. S., on raising 140-ft. concreting tower in one piece h*242
Hammer clutch, turnbuckle adjustment for (E. E. Glass) h899
Hammond, H. D., on modern plant performance in concrete road construction.. *784
Handling materials in construction of New York hotels *222
Hansel, C., on the public and the engineer.. 646
Harbors, river and harbor estimates for next year 919
Harding, R. J., on civil engineering and public health 920
Hardman, R. C., on concrete flag-pole poured erect *173
On curved pipe used to prevent air pockets in concreting scroll case....h*963
On improvised backfiller cuts costs on Panama sewer job h*834
Harger, W. G., on proportion and reasonable economy in rural road design *324
Harrison, T. S., bequest for bettering Philadelphia government 136
Haskins, C. A., abandons contract for outfall tunnel section, Passaic Valley sewer n147
Hay used to line dam slopes 378
Hazen, A., appreciation of F. P. Stearns.n*904
Headgates combined with bridge over aqueduct canal *610
Health, Public; see Sanitation
"Healthmobile," New York State 74
Heater, electric, for rivets..... n*908
Heck, G. E., on "compression" wood and failure of factory roof-beam *508
Henny, D. C., on what will engineers pay to improve their status? 722
Henry, A. J., on floods on lower Rio Grande in New Mexico and Texas 1001
Hetch Hetchy dam, new, to be one of world's highest n244
Bid accepted n292
Hibbs, M. E., on easily memorized method for finding safe beam loads 115
(G. S. Burell and W. H. Cullers) letters 388
High cost of living and low-production crisis e397
High-tension wires to steam shovels, carrying h*832
Highway Transport Committee's work taken up by Federal Highway Council..... n680
Highway Transport Conferences, program for n903

HIGHWAYS

American Road Builders' Association.... meeting n744
Arizona, convict labor 88
Arkansas, long contracts 87
Army motor trucks, delivery to state departments resumed n714, n746
Army's road-building plant may go to states n533, n583
Australia, activities in n340
Bituminous-macadam, Rhode Island (I. W. Patterson) e974, e974, *976
Bond issues:
California carried ..... n 99
Canadian, for $20,000,000 passed n148
Good roads (Iowa) without great debt in bond issues 704
Maine, authorized n633
Maine votes to increase indebtedness from two to ten millions n714
Mississippi proposes n967
New York State officials and others discuss road finance n1078
Throughout United States n244
Bow-frame belt used in finishing concrete roads h*40
Brick:
Illinois specifications for monolithic brick roads (C. H. Pierson and C. Older). ..... letters 238
(H. C. Adams and C. Older) letters 383
Indiana specifications 819
Is beam strength the important item? (W. P. Blair) 699
Lugless standard e845
Manufacturers seek specification changes 854
Tests of thin-base monolithic-brick road (H. H. Edwards) *134
Bridges; see Bridges, Highway
British, grants for 599
California, bond issue carried ..... n 99
California, final stretch of "Ridge Route" paved n968
California good roads pay for themselves twice every year (J. C. Veenhuyzen) e201, 214
Canadian; bond issue for $20,000,000 passed n148
Car shortages big limiting factor in construction n841
Character and cost, for motor trucks (S. Whinery) 77
Cheaper types, field for e346, (F. S. Greene) 353
Chicago Sanitary District will build 60 miles of road n100
Classification and uses, and influence of Federal-aid acts (T. H. MacDonald).. 985
Cleaned by compressed air before oiling (Maj. W. A. Welch) *933
College courses investigated by Asphalt Association n487
Concrete:
Bow-frame belt used in finishing h*40
Carpet of screenings insures clean aggregate h675
Cement concrete and bituminous concrete specifications, Indiana 819
Central loading plant for motor truck haulage h*965
Charted summary of state specifications (A. N. Johnson) .....
Does rich concrete in roads crack more in lean? (J. C. Pearson, W. D. Uhler, E. N. Hines, F. S. Wilson, A. N. Johnson, C. Older, D. A. Abrams, A. H. Hinkle) e491, 51[illegible]
(B. H. Tong) letter 7[illegible]
Flat-car cement stock pile .....h*[illegible]
Forms, keeping clean for tampers .....
Gravel hauled with caterpillar tractor in Minnesota .....
Indiana specifications, new features 614, [illegible]
Large mixer puts in 180-yd. slab every hour .....
Machines take place of men on 20-mile road .....
Motor-truck skip and small bin protect subgrade .....h*[illegible]
Pavement, reinforcing in.....
Pebble-washing plant, Michigan County saves $10,000 on its own .....
Plant performance, modern, in concrete road construction (H. D. Hammond) *784
Removing diamond-shaped serrations h*[illegible]
Removing marks of belt finishing ..h743
Side-hill loading plant.....*94[illegible]
Steel ribs on wide concrete-finishing belt prevent warping .....h*[illegible]
Striking off superelevated curves ...h*[illegible]
Templet with saw teeth cuts off and finishes surface .....h*83[illegible]
Thickness of slabs for surfaces....a*[illegible]
Utah contracts for largest amount per capita .....
Conference planned by Associated General Contractors of America.....n715
Construction problem in West Virginia mountains (M. A. Rogers).....* 90
Contractors, enterprising, use machine instead of hand methods *784
Contractors, large, shun roadwork (Practical Engineer) ..... letter 38, e49
(W. J. Hoskyn) .....letter 284
(L. B. Smith) .....letter 480, e637
Contracts, letting next year's contracts this year e638
Convict labor, in Arizona .....
Convict labor, in New Jersey, main-route construction *407
Cost, maintenance and life .....
Cost of; what has New York received for its $100,000,000? (H. E. Breed).. .....e447, 450
Curves, banked, screeding easements of (G. A. Curtis) *274
Superelevated, method of striking off.h*289
Superelevation of, discussion on 1062
Delaware, annual meeting and exhibit..n311
Designed, only, built in Iowa.....953
Designing, a science e203
Digger for breaking old macadam preparatory to resurfacing h*195
Distribution of 1920 funds n746
Drainage and again drainage e974
Drainage on main-route construction, New Jersey *407
Drainage, tile, for Iowa county highways (J. A. King) *761
Driller-crusher-tractor needed (S. H. Lea) letter 962
Engineering fellowships offered by University of Michigan n679
Engineering, suggested course in (R. T. Brown) .....letter 580
Engineers, salary scheduled proposed by A. A. E. committee 677, n714
Engineers, state, salary scale proposed by A. A. E. committee.....1046
Engineers' work in France (C. M. Buck) ..... letter 39
with editorial comment
Experience and highways.....e1037
Federal aid, extension proposed in House bill n292
Five states ask more n291
In June n149
Influence of acts (T. H. MacDonald)... 985
States taking allotments of funds rapidly .....n 98
Townsend bill, revision considered....n902
Federal:
Commission, no provision yet.....n715
Department proposed in Osborne bill..n 98
Townsend bill and state-aid law not in conflict n441
Townsend bill hearings set n836
Townsend bill may be dropped n836
Feeder, traffic control on e251
Finance; see Highways, Bond Issues
Forest Service, work handicapped n393
Funds, 1920, distribution n746
Gasoline tax for road funds.....916
Good roads (Iowa) without great debt in bond issues 704
Good roads pay for themselves twice every year (J. C. Veenhuyzen) ..e201, 214
Grange, National, views on.....n835
Granite-block, device for mixing filler..h*338
Gravel hauled with caterpillar tractor in Minnesota *227
Highway engineering a science e203
Highways Industries Association aids road promotion n538
Illinois, specifications for monolithic-brick roads (C. H. Pierson and C. Older) .....letters 238
(H. C. Adams and C. Older)..letters 383
State will pay for materials on delivery n840
Impact, motor-truck, five times dead load *573
Indiana, bituminous concrete and brick roads, specifications 819
Concrete, new features in specifications 614, 819
Spending $5,000,000 on roads n488

Page

Iowa, bridge and culvert surveys 140
County, tile drainage (J. A. King) *760
Iowa, engineers teach doctrine of designed roads 953
Good roads without great debt in bond issues 704
Made impassable by rains e718
Paved, built in installments from dirt roads 1008
Large construction firms shun road work (Practical Engineer) .....letter 38, 49
(L. B. Smith) .....letter 480
Large state projects n841
Letting next year's contracts this year..e638
Long contracts in Arkansas 87
Macadam, light, high cost of maintenance e346
(F. S. Greene) 353
Machinery and paving companies accused of bribery n715
Machinery companies cited for unfair competition n1081
Main-route construction in New Jersey..*407
Maricopa County, Arizona, asks bids on entire system n1080
Maryland, apportionment of costs n1078
Massachusetts, retention of highway commission members urged n841
Materials:
Early transport urged n745
Illinois will pay on delivery n840
In Texas n290
Scarce e637
Wisconsin supply not depleted.....n746
Missouri Valley Road Builders' Association organized n535
Motor-truck impact on roads five times dead load a*573
National forests, roads in n291
"National Highway System," booklet issued by American Automobile Association n152
New Jersey, high traffic record on New Jersey road 236
Main-route construction *407
New York, cost, maintenance and life.. 8
State officials and others discuss finance n1078
What has state received for $100,000,000? (H. E. Breed) e447, 450
Officials change frequently e1037
Ohio counties vote levies for.....n903
Oregon, county commissioners to meet..n487
Patrol, bonus paid in Wisconsin 162
Patrol established in Wyoming 524
Paved, Iowa, built in installments from dirt roads 1008
Pavements:
Asphalt, light portable plant for patching *1068
Asphalt-block handling at Army base h*439
Baltimore, recorded by map and file system (R. K. Compton).....*865
Bituminous paving of railway crossings 696
Corner gutters depressed in Cheyenne, Wyo. 424
Creosote oil specifications declared "closed" by Chicago court n1080
Engineer should select types (F. A. Churchill) .....letter 37, 149
Filler, device for mixing h*338
Granite-block, splitting and relaying..1069
Need for design (D. Moomaw)..letter 480
Streets and aisles, Brooklyn Army supply base.....*400, h*439
Wood-block, corrugated spacer for (J. S. Crandell) *463
Wood-block, creosote oil specifications declared "closed" by Chicago court n1080
Paving assessments, computation of (R. D. Gladding) .....letter 672
Pennsylvania adopts system of rewards for road work n292
Pennsylvania 1919 contracts total 649 miles n968
Program, dangers besetting.....e845
Real cost of e447, 450
Rewards for roadwork, Pennsylvania adopts system n292
Rhode Island, bituminous-macadam (I. W. Patterson) e974, *974
Rural road design, proportion and reasonable economy (W. G. Harger) *324
Salt Lake County, bond-issue program..*1015
Screening easements of banked highway curves (G. A. Curtis) *274
Shade trees on e492
State department standards e638
Stone sizes standardized.....n967
Streets:
Asphalt pavement, device for scooping up and loading (R. H. Moulton)..h*289
Light portable plant for patching....*1068
Laying concrete in cramped alleys (W. W. Horner) h*288
Subgrade and air temperatures, comparison of (C. C. Wiley) *128
Terminals needed? (C. H. Norwood) ..... letter 38, e49
Texas, materials in n290
Texas state highway engineer to be highest paid state official n1081
Tile drainage for Iowa county highways (J. A. King) *760
Timber roads in France, with split poles and sleepers, used by British Army...*160
Townsend bill; see Highways, Federal.
Traffic record, high, on New Jersey road. 236
Utah, bond-issue program in Salt Lake County *1015
Contracts for largest amount of concrete road per capita..... 355
Virginia, new laws signed.....n679
War Department equipment, bills for transfer n678
Washington State, county commissioners to meet n487

Page

West Virginia mountains, construction problem in (M. A. Rogers) *90
Wisconsin, bonus for road patrol..... 162
Wyoming establishes road-patrol system. 524
Plans permanent good-roads association n968
Highways Industries Association aids road promotion n538
Highways Transport Committee, policies stated, and members n339
Hill, C. R., with L. R. Manville, on concentrated load tests of yellow-pine beams for shear *69; (H. D. Dewell) .....letter 388
Hillside, sliding, at Cleveland, Ohio.....*164
Hines, A. N., on does rich concrete in roads crack more than lean?.....e491, 518
Hinkle, A. H., on does rich concrete in roads crack more than lean?.....e491, 518
Hirst, A. R., address before American Association of Highway Officials.....e845, 856
Hoists, electric, pull 3000-ton building 450 feet *706
Hoover, H. C., dinner to, by American Institute of Mining and Metallurgical Engineers...n485, e491, n534, e589, e590, *600
Horne, R. W., on graphical method for estimating storm-water run-off *282, corrections 410
Horner, W. W., on heavy rain destroys sewer and railway at St. Louis.....*958
On laying concrete in cramped alleys..h*288
Horses, cost of maintaining per day..... 647
Decrease in use of, in cities..... 733
Horton, H. E., and triangular bridges (J. W. Pearl) .....letter 1073
Horton, R. E., on watershed leakage in relation to gravity water-supplies.....a826, 856
Horton, T., on supervision of public water-supplies by State of New York.....a812

HOUSING

Federal and provincial aid in Canada.. 649
Industrial, effect of size of lots on (M. Knowles) 955
Keeping costs of building Government houses e250, *252
Permanent bureau proposed in House bill n243
Housing Corporation, United States, bill to end n393; (C. E. Henderson) letter 480
Report 578
To be abolished n1077
Houston, Tex., harbor development..e154, *156
Howard, N. J., on Toronto drifting-sand filter results a*822
Howe, H. M., made honorary member, American Society for Testing Materials. 14
Hudson River channel, New York City tries to encroach on.....n681
Long-term variations in flow (E. H. Sargent) *360
Tunnel, see Tunnels, Hudson River
Hughes, H. J., review of "Elements of Astronomy for Surveyors"..... 891
Hughman, E. M., secretary of New India society of engineers n*840
Hunt, C. W., on membership and functions of local engineering associations e50, 87. (K. B. Knudsen) .....letter 237
Hunt, R. W., made honorary member American Society for Testing Materials..... 14
Hurley, E. N., retires as chairman of Shipping Board n148
Hydraulic fill, canvas pipe gives flexible distribution of sluicing water h*390

HYDRAULICS

Diagrams for excess loss of head in pipe lines (F. S. Bailey) *162
Differences in seasonal stream flow in France, utilizing (E. H. Sargent)....*462
Duty of water in irrigation (H. F. Robinson) *355
Formulas:
Kutter's, determination in drainage ditch (R. Bosard) *921
Manning, another diagram for solving (R. D. Goodrich) *648
Manning, nomographic chart for solution (M. J. Shamray) .....letter *194
Hexagonal chart for finding velocity of water in pipes (C. W. Anthony) .e153, *169
Long-term variations in flow of Hudson River (E. H. Sargent) *360
Nomographic chart for solution of Manning formula (M. J. Shamray) *194
Spillway capacities for reservoirs in Western United States (J. T. Whistler) *28
Venturi meters, computation of coefficient of discharge (W. S. Pardoe) *606
Water-hammer in penstocks and economy of design (E. Crewdson and A. H. Reeves) .....letters 437
Water-hammer, What causes? (C. B. Gibson) letter 530; (N. B. Sweitzer) letter 710; (W. P. Bullock) letter 828
Hydraulicking dam embankment on Miami flood-control project *371
Hydro-electric power, see Water-Power

I

Idaho Engineers' licensing law.....n293
Illinois Architects' license law.....n293
To pay for road materials on delivery..n840
Illinois Association of Members of Am. Soc. C.E., coöperates with Western Society of Engineers.....n834
Illinois Central R.R., new lake-front terminal, Chicago.....n196
Imhoff tanks for Worcester, Mass..... 796
Imperial Valley, California, irrigation bond issue voted.....n681

Page

Imports, see Trade, Foreign
Impressions here and there:
Cleveland, public-works engineering in... 996
From Niagara to Ottawa..... 797
In the Pacific Northwest..... 884
Pittsburgh 769
India, engineers to unite in single society, n*840, dues e909
Water-power studies in..... 263
Indiana road specifications, bituminous concrete and brick..... 819
Indianapolis, grade crossing elimination... 266
Track elevation.....*265
Union station rebuilt without interrupting traffic.....*84
Industrial conference called by President Wilson e491
New board named e776, e781; formulates plan of procedure n966
Completes preliminary report n1080
Industrial Relations, new labor publication 892
Influenza and pneumonia in Army camps (Maj. G. A. Soper) *72
Inland navigation for ocean steamers e154, *156
Institution of Civil Engineers favors registration n836
May regulate British engineering practice n442
Insulation resistance in motors reduced by moisture (W. W. Brush) a818
International Railway Congress dissolved; reorganized as International Railway Association n837
International Trade Conference to be held n343
Interprofessional Conference held in Detroit.....n745, e782, 808, n835
Interstate Commerce Commission, engineer for, urged by Engineering Council....n442
Engineers to be released.....n339
Investment securities, engineers and.....e1038
Iowa board of examiners appointed.....n631
Engineers must register.....n1033
Engineers, dates set for registration....n1082
Good roads without great debt in bond issues 704
Motor-vehicle license fees and speeds... 278
Iowa, University of, engineering fundamentals for four year course (W. G. Raymond) .....letter 959

IRON

Cast, synthetic, large production..... 820
Malleable cast iron, properties of.....*132
Ore output decreases..... 521

IRRIGATION

Australia has large projects..... 215
Bond issue voted in Imperial Valley....n681
Columbia Basin project report nearly completed 800
Construction details, Lindsay-Strathmore district, California *348
Drainage for irrigated land, Yakima County, Washington 984
Drainage works of Rio Grande project (J. L. Burkholder).....*543
Duty of water in (H. F. Robinson).....*355
In fourteenth census (R. P. Teele)..... 926
Lindsay-Strathmore District, California, Construction details.....*348
Offset cantilever gate hoist support *988
Operating methods and results..... 474
Naches-Selah canal, reconstruction (E. M. Chandler) *276
Nondrainage of irrigated lands causes malaria 207
Pumping station undermined by leaks and shut down *941
Reclamation Service projects need $262,000,000 .....n680
Reconstruction of Naches-Selah canal (E. M. Chandler) *276
Rio Grande project, drainage works of J. L. Burkholder) *543
Sand removed from canal by sluicing... 998
Storage arguments confirmed by nature e718
Templet used in clearing sand from canal 800
Training partition in canal inlet increases capacity *922
Tunnel, 14-mile, may be built in Washington n196
Washington State, Columbia Basin Survey Commission completing surveys..n714

J

Jacks, sand, used to lower a 400-ton dock caisson gate (G. W. Plaisted).....*886
Jacks, special rig for jacking up bridge spans (C. Baker) h*832
Janney process for reproducing tracings improved n844
Jersey City, N. J., water-supply; large concrete-cased steel pipe laid in one piece *176
Johnson, A. N., on charted summary of state concrete road specifications....*160
On does rich concrete in roads crack more than lean?.....e491, 518
Johnson, O., on longest suspension bridge in New Zealand.....*283
Johnson's formula for repeated stresses, broader use of (Prof. J. B. Kommers)..*942
Joint Conference Committee's report on unification n835
Joint Employment Bureau—work of...e974, (E. B. Miller) .....letter 1025
Jones, L. W., new dean of college of engineering, University of Minnesota.....n246

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

K

Jones-Reavis bill for Department of Public Works, n149; supported by American Association of Engineers, n533; certain points of, n585
Kansas Highway Commission aids in coal emergency n1031
Kansas takes over coal mines.....n745
Kansas City Engineers' Club to get city growth data on which to base civic opinion 93
Kaw River, Kansas, bank protection.....*410
Keller, Lieut. Col. C., promoted to colonel; his career n969
Ketchum, M. S., new head of civil engineering college, University of Pennsylvania n*632
Kimball, T. R., on a common professional program.....e782, 808, n835
King, J. A., on tile drainage for Iowa county highways.....*760
King, W. B., on Congressional persecution of contractors and manufacturers.....1044
Kirkpatrick, W. G., engaged as consulting engineer and director of public works, Monroe, La..... 82
Kistler, H. M., on methods used by Germany in overcoming tire shortage.....*701
Kittaning, Penn., refused permission to build duplicate water-works.....n583
Knowles, M., on effect of size of lots on industrial housing..... 955
On lack of foresight in municipal water-supplies 599
Knuckle guard for wheelbarrow handles (J. H. Sawkins) h*1074
Kommers, Prof. J. B., on broader use of Johnson's formula for repeated stresses.*942

L

LABOR
Accident-prevention instructions..... n99
American Federation, farmers will not affiliate with e717
On trial e539
Building trade employers and employees sign two-year wage agreement.....n905
Building trade wage increase since 1913 .....*788
Camp beds and bedding reduce labor turnover (W. C. Ruegmitz)....e202, 213
Changes in value of dollar.....*937
Churches and labor.....e910
Coal strike, see Coal
"Conditions, then and now" (J. E. L. Monaghan) letter, with editorial comment 828
Construction e397
Construction labor's instability.759, 813, 876, 939, 1051
Convict, on Arizona highways..... 88
Democracy or partnership in labor management 177
Efficiency largest element in cost and price e297
Emigration exaggerated.....e685
Faith and good works.....e1037
Germany, eleven-hour day in.....e540
Grievances heard by Senate committee e717
Increase in cost of 540 per cent..... 621
Industrial conference called by President Wilson, e491; new board, n776, e781; plan of procedure, n966
Industrial Relations, new publication.... 892
Lost time reduced by shifting crews (A. S. Fry) h145
Low wages in France and Belgium.....e685
Motor trucks carry Dodge Bros. employees during street-car strike in Detroit n*446
No oppression by any group.....e447
Personal element, the (P. B. McDonald) 809
Portland, Ore., conditions.....n838
Railway track 697
Railway wage board, permanent, urged..n533
Report of Canadian Commission on Industrial Relations 223
Saved by contractor's resource (W. F. Reichardt) h*712
Seattle advances pay of city employees.. n46
Six-hour day, five-day week.....e540
Strikes:
Boston police e539
British railway, service of motor trucks in 946
Coal, see Coal
Hopeful features e589
Printers' strike ended.....e749
Public the court of last resort.....e589
Shopmen, railway e447
Steel, Senate committee hears men's grievances e717
Western trainmen heed Hines ultimatum n485
Sunstroke and lightning as viewed by compensation commissions (C. C. Sherlock) 403
"Team spirit" plan, British, for building trades *1000
Union label on plans opposed by Oregon engineers n779
Unions' bill of rights.....e1037, e1038
War Labor Board ends.....n339
Ladders, slope and inclines..... 78
Lake port planning.....e398
Land reclamation, soldier settlement bill reported in House.....n291
Land values raised by drainage..... 881
Langfitt, Col. W. C., mentioned for chief of engineers by New York Chapter, A. A. E. e719, n744, n777
Langley Field, Virginia, sewage-treatment works (T. Saville and C. L. Weir), *374, correction 402
Launchings, see Ships, Launching
Lavis, F., on what will engineers pay to improve their status? 720
Lawsuit over Chicopee, Mass., standpipe e1039, 1053
Leakage test, wood-stave pipe line (V. M. Crown) *264
Leaks, small, cause large losses (E. E. Glass) h964
Lee, C. H., appointed California water commissioner n714
Lee, W. E., on Baltimore water-works enlargement recommended n630

LEGISLATION
Alaska Ry., more money asked.....n196
Bridge across American channel at Detroit; United States Senate passes bill.n904
Bureau of Housing and Living Conditions, bill drafted 393
California replaces county surveyors by county engineers n197
Canadian bond issue of $20,000,000 for roads passed n148
Canal transportation, bill to give Interstate Commerce Commission control of rates n243
Contractors on Government work, unpaid, relief sought n392
Cummins bill, n485; passed by Senate n1077
Daylight saving repeal....vetoed n148; again up, n290; passed over veto, n394
Department of Public Works bills n41, n149, n585, supported by A. A. E., n533; discussed by Am. Soc. C. E. 630
Duluth Engineers' Club questions members concerning 93
Engineers should study.....e105
Esch railroad bill passed by House.....n745
Esch bill analysis (E. E. Denison)..... 885
Federal aid for roads, extension proposed n292
Influence of (T. H. MacDonald)..... 985
Federal Department of Highways proposed in Osborne bill n98
Federal Highway Commission, no provision yet for n715
Federal highways, Townsend bill and state-aid law not in conflict.....n441
Gulf to Atlantic canals proposed..... n98
Housing, permanent bureau proposed in House bill n243
Housing Corporation, bill to abolish n393, (C. E. Henderson).....letter 480
Housing Corporation to be abolished ..n1077
Hudson River tunnel, Congress authorizes state agreement n98
Idaho engineers' licensing law.....n293
Illinois architects' license law.....n243
Illinois deep waterway from Chicago Drainage Canal to Illinois River, bill signed e105, n147
Illinois surveyors' license law.....n441
Iowa motor-vehicle license fees and speeds 278
Jones-Reavis bill for Department of Public Works....n149; supported by A. A. E., n585; certain points of, n585; engineers urge commerce body to indorse, n967
Massachusetts water-supply to be studied n243
Milwaukee sewerage commission, bill to make city engineers eligible is vetoed. n99
Motor-vehicle, Pennsylvania law to curb thefts n198
Muscle Shoals, Ala., nitrate plant may be enlarged n835
Nevada may have state cement mill....n197
Oil shale resources of United States, bill to investigate 327
Patent office—reorganizing, hearing on bills n147, n341
Pennsylvania adopts system of rewards for road work 292
To curb motor-vehicle thefts.....n198
Public Service Corps bill.....n392
Road-building equipment, War Department's, bills for transfer.....n678
Railway control, Cummins bill.....n485
Railway control, analysis of Esch bill (E. E. Denison) 885
Comparison of various bills..... 874
Cummins bill to be passed n1029
Cummins bill passed by Senate n1077
Railroad return n715
Roads in national forests.....n291
Soldier settlement bill reported in House n291
Special, avoiding ban on..... 573
St. Paul increases tax limit..... n99
Surveyors licensed in Texas..... 315
Texas, surveyors licensed in..... 315
Townsend bill, hearings set..... 836
Townsend bill, may be dropped.....n836
Townsend bill, revision considered.....n902
Virginia highway laws.....n679
Washington, D. C., zoning and building bill passed by House.....n584
Water-power bill....hangs fire, n101; passed by House of Representatives, n147; reported by Senate, n583
Weights and measures laws being compiled n680
Lenth, G. C. D., on steam shovel digs sewer trench in narrow space *1064
Letters, how to apply for job by letter (B. T. Brown) .....letter 770
Levee and Drainage Contractors' Association of America to meet n1077
Lightburn, C. M., on engineering societies' paramount problem..... 894
Lightning and sunstroke as viewed by compensation commissions (C. C. Sherlock) 403
Pushes sidewalk off concrete bridge.... *68
Lindenlea garden suburb and housing plan, Ottawa, Ont. *412
Lindenthal, G., on plan to finance Federal purchase of railways.....50, e592
Lindsay-Strathmore Irrigation District, California, construction details....*, operating methods and results, 474
Lining reservoir with concrete by cement gun (E. C. Eaton) *167
Lippincott, J. B., on extending Galveston sea wall *617
Loads, wheel, on highway bridge floors (H. F. Blood) .....letter 190
Locomotive, gearless electric develops 115,000-lb. tractive effort n*1034
Locomotive transported by motor truck in timber lands.....h*834
Locomotives, steam, revolutionary changes in e975
Logansport, Ind., engine terminal.....*34, 163
Longley, Col. F. F., assistant director, Division of Sanitation, Red Cross.....n777
Lord, J. W., on fire hazards in storage of fuel oil a415
Lorente, M. J., on diagram for locating stirrups in concrete beams.....*310
Los Angeles Calif., assessment for water-main extensions 644
Building permits show increase..... 616
Starts to construct Owens George power plants n904
Union bus depot n1080
Louisville, Ky., new sewerage board to have more sewers.....n837
Lowell, A. L., views on aims of engineering schools e397
Lowell, Mich., solution of hydro-electric problems *650
Lowering 400-ton dock caisson gate with sand jacks (G. W. Plaisted).....*886
Low-production crisis e397

LUMBER
Approximate resources, United States.... 79
Dry, moisture content of..... 391
Durability of green and seasoned timber. 994
Enough for 150 years..... 612
Order for French contract being placed.n485
Prices high and advancing (A. W. Welch) n296
Seasoning, rapid, by kiln drying..... 853
Supply and forest protection.....e492
Swedish exports large..... 517

M

MacArthur Bros. Co. receive French housing contract n393
MacDonald, T. H., on classification and uses of highways and influence of Federal-Aid acts 985
Machines for handling heavy track material a1061
MacIsaac, F. J., on construction labor's instability 1051
Mackin, J. H., and E. J. Tully, on sewage-treatment report forms and testing apparatus *825
Macksey, H. V., nominated for president New England Water Works Association.n744
Madison, Wis., odors from lake investigated 469
Sewage-disposal difficulties.....*510
Maine, highway bond issue authorized.....n633
Malaria caused by nondrainage of irrigated lands 207
Manganese exports from Brazil..... 311
Manila, excessive rainfall at..... 677
Manning formula, see Hydraulics, Formulas
Manufacturers, Congressional persecution of 1044
Manufacturers' Publicity Bureau issues monthly n151
Manufactures, careful census to be taken.. 929
Manville, L. R., with C. R. Hill, on concentrated load tests of yellow-pine beams for shear.....*69, (H. D. Sewell) letter 388

MAPS AND MAPMAKING
Board of Surveys and Maps recommended by Washington conference....n714
Government mapmaking agencies, coördination urged n341, n681
Military opinions on scales for United States maps 708
Scales, military opinions on, for United States maps 708
Marburg, E., memorial meeting..... 14
Markets, municipal, in United States..... 496
Marston, A., on business training for engineers 187
Massachusetts against radicalism.....e685
State departments reorganized.....n966
Water-supply to be studied.....n243
Massachusetts Highway Commission, retention of members urged.....n841
Massachusetts Institute of Technology contracts with industries n966
Endowment fund drive n488
Mast, concrete, 164 feet high, built in place 952
Material Handling Machinery and Factory Appliance Exchange n149

MATERIALS
Allotted to states by War Department...n245
Army, surplus, for sale.....n442
Building, prices, 1914-1919.....*799
Engineering, high prices in France..... 275
Testing ..... el
Mattress, long board, sunk in narrow channel *230
McCullough, C. B., on arch bridge with ribs anchored by concrete keys.....*924

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

McAlpin, G. W., on old boiler flues for coffer plates h*900
McDaniel, A. B., receives Wason medal n42
McDonald, M. W., and L. E. Moore, on military bridges e687, *688, *734, (J. W. Pearl) ..... letter 1073
McDonald, P. B., on personal element in labor 809
McFadden, D. J., on endless track arrangement for carrying away at steam shovels h*484
On home-made quick-opening valve for small tanks h*713
McGee, H. G., on diagram adaptation of rational method of storm-water drain design *868
McGeehan, P., on Army's light-railway practice in France *653
McIntosh, R. P., on fundamentals in design of multiple-arch dam e447, *464
Mears, Col. F., chairman of Alaska R. R. Commission n340
Mechanical device for reading curves and tables *644
Medal, American Concrete Institute, awarded to W. L. Comyn for building first concrete ship n42, n*100
Medal, Wason, awarded to A. B. McDaniel, C. W. Gow and D. A. Abrams n42
Merchant Shipbuilding Corporation and Chester Co. consolidate n341
Merriman, M., made honorary member American Society for Testing Materials .. 14
Metal lath fire-resisting, to be tested n636

METERS

Cincinnati completing program 876
Prevent water famine at Pocatello, Idaho 611
Render additional water-supply unnecessary, at Middletown, Conn. 613
St. Paul meters 91.8% of water service 74
Water and curb cock box, combined. 1084

MIAMI FLOOD-CONTROL WORKS

Block yard cheaply improvised from old equipment *356
Canvas pipe gives flexible distribution of sluicing water h*390
Concreting procedure on dams *640
"Contract Forms and Specifications, with Atlas" (book review) 380
First valley closure completed e845, 853
Hydraulicking dam embankment .. e345. *371
Largest use of electric power on construction work *417
Railway changes, radical, involved in work *313
Study of pressure in hydraulic dam cores, e1037, *1040
Michigan engineers' registration law 697
Registration board for engineers and architects n967
Water-treatment plants, supervision 1067
Michigan University offers highway engineering fellowships n679
Middletown, Conn., additional water-supply rendered unnecessary by metering 613
Milk hauled by motor truck into trucks .. 758
Milwaukee water siphon under river a difficult job 818
Milwaukee Engineers' Society active civic affairs committee 93
Milwaukee Sewerage Commission remains unchanged h99
Mine, deepest, is Michigan Tamarack shaft. 403
Mine timbers, concrete, hollow posts packed with sand *269
Mineral products, output in 1918 947
Minneapolis will have right to buy street railways n633
Minnesota University to correlate schools of chemistry and engineering n246
Mirror extensometer for testing wire a*32
Mississippi proposes road bonds n967
Missouri Valley Road Builders' Association organized n535
Moisture content of Dry lumber 391
Reduces insulation resistance in motors (W. W. Brush) a818
Moline, Ill., typhoid outbreak caused by faulty bypass valve e106
Mondell, F. W., on postal zone law is menace to nation ..... 629.
Soldier settlement bill reported in House n291
Monroe, La., engages W. G. Kirkpatrick as consulting engineer and works director .. 82
Montauk Point terminal scheme e201, n243, e297
Montreal aqueduct arbitration favorable to city n534
Montreal aqueduct, headgates combined with bridge over canal *610
Moore, L. E., and M. W. McDonald, on military bridges e687, *688, *734, (J. W. Pearl) ..... letter 1073
More, Maj. C. C., with Capt. W. E. Duckering, on problem method at Army Engineer School 183
Morrissey, W. J., on construction labor's instability 759
Mortar, test, for concrete, more against (J. O. Jones) ..... letter 581
Mosquitoes troublesome on nondrained irrigated land, California 207
Motor Transport Corps to make ocean-to-ocean trip n43

MOTOR TRUCKS AND OTHER MOTOR VEHICLES

Allotment to states by War Department n245
And railways, for freight transportation e2, e50, (C. W. Baker) 52, (W. Jackson) letter 434; (J. Wilkes) letter 829
Boardwalk for h*337
Bus for city traffic e399

Page

Carry employees of Dodge Bros. during street-car strike in Detroit *446
Chicago, increase in 280
Demountable body for handling piled material n*248
Dump body tilted and dumped by chain. h*773
Dumping fixed-box, improvised method. h*876
Express lines planned for rural New York n486
Express route tariff sheet adopted 424
Food committee, New York, recommends rural motor express n199
Frame used for hauling men to and from work h*964
Haul milk into Detroit 758
Haulage, central loading plant for h*966
Highway Transport Conferences, program for n903
Highways for, character and cost (S. Whinery) 77
Impact on roads five times dead load .. a*573
Iowa license fees and speeds 278
Law to curb thefts, Pennsylvania n198
License fees and speeds in Iowa 278
License fees, Massachusetts 431
Motor Transport Corps to make ocean-to-ocean trip n43
Pennsylvania, increase 313
Service during British railway strike .. 946
Skip and small bin protect subgrade .. h*1027
Small, may have dump or fixed body .. n*151
Texas, earn large pay in oil fields n292
Transport problems discussed by National Highway Traffic Association, North Atlantic division n776
Transport locomotive in timberlands .. h*834
Wrecker, Boston Fire Department n*295
Motors, insulation resistance in, reduced by moisture (W. W. Brush) a818
Moulton, R. H., on device for scooping up and loading asphalt pavement h*289
Mucking machine, electric, used on Hetch Hetchy tunnels 996
Mulcahy, W. A., and H. E. Young on cofferdam experience at bridge in Chicago River e249, *268
On substructure of Michigan Ave., Chicago, bascule bridge *210
Multiple-arch dam, fundamentals in design (R. P. McIntosh) e447, *464
Multiple outlet provides for variable sewage flow (S. T. Smetters) *728
Municipal Government, Improvements, Ownership, Etc., see Cities.
Muñoz, Maj. G. C., on powder magazines made to look like trees *280
Muscle Shoals, Ala., nitrate plant, may be enlarged n835

N

Naches-Selah irrigation canal, reconstruction (E. M. Chandler) *276
National Association of Railway and Utilities Commissioners to meet n633
National Budget, The, new publication 892
National Engineering Council or American Association of Engineers (K. B. Knudsen) ..... letter 237
Scheme of organization (L. B. Smith) .. letter 190
National Federation of Construction Industries press coal priority claims, n902, n966
National forests, roads in n291
National Grange refuses to affiliate with American Federation of Labor e717
"National Highway System," issued by American Automobile Association n152
National Highway Traffic Association, North Atlantic division, discusses transport problems n776
National Industrial Conference Board, joined by American Society of Mechanical Engineers e750, e751
National Public Works Department Association n1030
National Safety Council organized engineering section n714
Construction Section, discusses business at breakfast e782
National Septic Process Protective League settles claims for septic tank royalties .. n714
National Service Committee, funds for refused by American Society for Testing Materials e119
Observations n100
Nature confirms engineers' arguments e718
Naval Architects and Marine Engineers tell of progress in shipbuilding n777
Navigation, inland, for ocean steamers e154, *156
Navy Technical Association joins American Association of Engineers n44
Nevada may have state cement mill n197
Newark, N. J., garbage feeding contract .. 456
Employment of sanitary engineer is advised n1082
Zoning ordinance n1033, 1045
Newell, F. H., on what will engineers pay to improve their status? 720
Review of "Hydrology" (Mead) 1021
New England Water Works Association convention n535, e589, n747
Nominations n744
New Haven R.R. stockholders seek limited receivership n1030
New Jersey county engineers demand greater recognition n681
New Jersey ship canal agitated n836
Newman, A. J., on cement joints for cast-iron water mains at shipbuilding plant 609
On land drill on barge drills test hole in tidewater h*899
New Orleans Army supply base, building .. *122
Newport News, heavy double trestle for building cranes (R. W. Burpee) .. e717, e718, *723

Page

NEW YORK CITY

Engineers:
Rapid-transit, organize section of American Association of Engineers .. n969
Harbor:
City to build piers on Staten Island .. n197
Commission makes preliminary report. n196
Development hindered e153
Increases municipal engineers' pay n837
Municipal employees, movement to unionize all n631
Rapid transit:
East River tunnel holed through n339
Trying to encroach on Hudson River channel n681
New York Council Federal Highway Council, organized n244

NEW YORK STATE

Recommendations for shorter ballot, engineers should back e750
State engineer, should be appointed, not elected e750
Swamp drainage amendment vote n1081
Water-supplies, supervision by state (T. Horton) a812
New York State Association of Architects formed e448, n488
New York State Council of Federal Highway Council formed n485
New Zealand, largest suspension bridge in (O. Johnson) *263
Niagara railway arch, steel-plate drip floor for *620
Reinforced for heaviest traffic *877
Nitro, W. Va., Government receiving bids for n444
Nitrate plant, Muscle Shoals, Ala., may be enlarged n835
Nobles, G. S., on concrete used in boiler-house structure and fittings *262
North Dakota will build grain elevators .. n46
North River, see Hudson River.
Northwest, Pacific—impressions here and there 884
Nuts, tight, on construction bolts h484

O

OBITUARY

Barrett, N. F., 780; Brown, S. P., 972, Butler, H., 1084
Carrere, H. V., 200; Church, C. T., 490; Cole, T., 446; Collins, T. H., 635; Cooper, T., *443; Cunningham, W. P., 446
Farrand, A., 294; Ford, W. G., 47; Frey, J. C., 48
Gantt, H. L., 843
Harris, W. D., 780; Hazelhurst, Maj. J. N., 48; Hazen, J. V., 780; Helson, R., 635; Himes, A. J., 780; Hodge, Col. H. W., *1079; Hooper, T. N., 102
Jackson, Sir John, 1036; Jacobs, C. M., *584; Jaycox, J. W., 683
Kennedy C., 1036; Kilbourne, Col. J., 200; King, T., 446; Kirchner, F. H., 972; Knoeller, W. M., 102
Leavenworth, G. F., 588; Livermore, Col. W. R., 716; Logue, C. E., 1036
McKenzie, A. C., 538; McNally, T., 490; Morton, T. L., 537; Muir, A., 1084
Noyes, L. W., 294
Oakes, G. W., 200
Phillips, E., 48
Remmers, F. J., 343; Boden, T., 683; Rodgers, J. C., 247; Rossell, Gen. W. T., 748; Ruemelin, O. A., 538
Sachs, E. O., 633; Sargent, F., 247; Shonts, T. P., 630; Stearns, F. P., 907; Strong, M. R., 908; Sykes, Maj. G., 446
Thomas, E. B., 538
Van Buren, R., 1084
Weaver, W. D., 748; Weddell, R., 635; Wilson, H. M., 632; Wilson, W. T., 843
Odors from lake at Madison, Wis., investigated 469
Office, engineer's, arrangement (H. P. Farrow) *502
Offset cantilever gate hoist support *988
Ohio health-district act 1067
Ohio River improvement, present status .. *952
Ohio technical societies to meet n634

OIL

Fuel, concrete tank design and construction a322
Fire hazards in storage (J. W. Lord) .a415
Shale resources of United States, bill to investigate 327
Storage, concrete tanks for tests made .. a16
Vegetable, handling at Pacific coast ports e201, *204
Older, C., on does rich concrete in roads crack more than lean? e491, 518
Ontario, hydro-electric work in 890
Ontario, Lake, discharge of, regulation proposed by F. C. Shenehon n678
Orange-peel buckets repaired without costly delays h*391
Order or anarchy e539
Oregon, city zoning authorized 498
Engineers oppose union label on plans .. n779
Registration of engineers begins n631
Ottawa, Ont., Lindenlea garden suburb and housing plan *412
Outlet, multiple, provides for variable sewage flow (S. T. Smetters) *728
Oxyacetylene flame used to cut granite .. h*390
Oxygen, dissolved, and sewage in New York harbor *228
In steel 940

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

P

Paaswell, G., on computation of lengths of elliptic arcs 221
Pacific coast, local council idea spreads.... 894
Pacific Northwest—impressions here and there 884
Paint service and paint technology (A. H. Rhett) .....letter 1072
Painter, C. E., on meters cut city water consumption in irrigated district *956
Painting practice, railway bridge 827, (A. H. Rhett) .....letter 1072
Palo Verde Valley levee work..... n44
Pan American Financial Conference, engineers on n1077
Panama, concrete shipping pier has novel design (G. W. True).....*912
Pardoe, W. S., on computation of coefficient of discharge of venturi meters.....*606
Parker, A. F., engage to investigate Utah water storage n535
Passenger train resistance tests 1017
Patent, wood-perforating dedicated to public n1082
Patent Office legislation n147, n341
Patterson, I. W., on bituminous-macadam roads in Rhode Island e974, e974, *976
Pavements, see Highways, Pavements.
Paving assessments, computation of (R. D. Gladding) ..... letter 672
Pearl Harbor dry dock dedicated.....n486
Dry dock pump well large precast unit (R. W. Gaylord) *861
Pearson, J. C., on does rich concrete in roads crack more than lean?....e491, 518
Pebble-washing plant, Michigan county saves $10,000 on..... 944
Pennell, J., proposed national art bureau... 194
Penstocks, water-hammer in, and economy of design (E. Crewdson and A. H. Reeves) ..... letters 437
Personal element, the (P. B. McDonald).. 809
Petroleum, crude, domestic deliveries.... 315
Philadelphia, city planning.....n1034
Government to be bettered, under terms of Harrison bequest..... 136
Proposes new loan bill.....n1034
Subway, new construction methods.e297, *300
Zone law proposed for..... 918
Philadelphia Association of Members, Am. So. C. E., energy and accomplishment..1069
Phillipsburg, N. J., sewage works conditionally authorized n584
Pier, concrete, at Panama, has novel design (G. W. True).....*912
Pier handling methods at New York City, consideration asked n680
Piers, sounding under, rig used for (R. W. Beuttenmuller) h*1075
Piledriver, light, operated by derrick without extra engine (F. W. Epps)..h*963
Piledrivers, mounted rig developed by Army.*232

PILES

Batter, excessive load on: Rondout Creek bridge design condemned for *329; (W. E. Belcher) .....letter 479
Creosoted, sound after 29 years.....*378
Durability in intertidal space..... 471
Foundations for unequal load distribution (E. P. Arneson) *698
Penetration of soft clay by, test made.. 946
Pinch bar, utility increased by casters..h*1028

PIPE

Breaks in St. Louis..... 918
Canvas, gives flexible distribution of sluicing water h*390
Concrete, and culverts, joint committee organized n98
Concrete, fails from unequal expansion of shell (Prof. G. E. P. Smith).....*113
Concrete, large, grouted at special joints, h*483
Curved, used to prevent air pockets in concreting scroll case (R. C. Hardman) h*963
Laying by force account, Salt Lake.... 469
Laying submerged pipe in shallow water (T. H. Hacker) h*964
Reinforced-concrete, made by centrifugal process (E. M. Weston) *707
Steel, concrete-cased, laid in one piece..*176
Taken up without uncoupling.....h628
Western wood pipe manufacturers form publicity bureau n844
Wood-stave, diagram for computing band spacing (W. T. Batcheller) *472; (E. A. Moritz) .....letter *710
Leakage test (V. M. Crown).....*264
Pipe lines, excess loss of head in, diagrams for (F. S. Bailey) *162

PITTSBURGH

Bond issue of $22,000,000 for improvements approved n148
Bridges, architects employed to design and oversee construction e686, n714
Impressions here and there..... 769
New bridge plan for.....n715
Public safety in.....e686, n714
South Hills tunnel and earlier projects..*166
Street-car loop subway condemned....n776
Street-car subway project held up.....n586
Street congestion 671
Street-railway, elements of value in..... 807
Three planning commissions..... 763
Tunnel contract awarded to Booth & Flinn n903
Underground street-car loop.....e105
Plaisted, G. W., on lowering 400-ton dock caisson gate with sand jacks.....*886
Plane-table or transit for topography? letters on (H. Wood) 95; (F. Vernon, K. Allen and F. J. Howes) 333, 334; (E. Low) 434; (W. Brown) 673
Planimeter measures exaggerated cross-sections (C. P. Mowry).....letter *436
Using, to compute earthworth (L. C. Craig) .....letter 240
Plans, ownership of 365
Plant performance, modern, in concrete road construction (H. D. Hammond)....*784
Plant-replacement fund provided by building-association stock (O. H. Yeager)..h1027
Plumb plan, railway control, see Railways, Control.
Pneumonia and influenza in Army camps (Maj. G. A. Soper).....*72
Pocatello, Idaho, meters prevent water famine 611; (G. Rae) letter, with editorial comment, 1073
Pollution by industrial wastes enjoined.... 711
Pontoons move 200-ton transfer bridge....*478
Portland, Ore., labor conditions.....n838
Proposed bridge-inspection contract....n776

PORTS AND HARBORS

Birmingham, Ala., work commenced on.n1034
Chicago River, closing to navigation suggested 321
Handling vegetable oils at Pacific coast ports e201, *204
Houston, Tex., harbor development.e154, *156
Inland navigation for ocean steamers, e154, *156
Lake port planning e398
Montauk Point terminal scheme..e201, n243, e297
New York commission preliminary report.n196
New York harbor, development hindered.e153
New York to build piers on Staten Island n197
Pacific coast, handling vegetable oils.. e201, *204
Wilmington, Del., authorizes improvements n533
Portsmouth, Va., dry dock, rapid concreting a feature of construction.... *494
Postal zone law is menace to nation (F. W. Mondell) 629
Potter, A. A., on modifications in engineering at Kansas State Agricultural College. 186
Powder magazines made to look like trees (Maj. G. C. Muñoz) *280
Powell, S. T., and A. Wolman, on sanitary effect of water storage in open reservoirs *804
Power output, electric 549
Power: solving hydro-electric problems of small town *650
Precast concrete pump well set in 12 feet of water *954

PRICES

Building materials, British and American (A. G. Duke) .....letter 142
Changes in value of dollar.....*937
High, for engineering material in France 275
Lumber, high and advancing (A. W. Welch) n296
War, in bulletin 232
Printers' strike ended e749
Printing telegraph valuable during war.. 227
Prints filed in rack (C. P. Rumpf).....h*531
Prior, J. C., and H. P. Green, on keeping costs of building Government houses.. .....e250, *252
Pritchett, C. M., on convenient table for locating short-radius curves h1076
Problem method at Army Engineer School (Maj. C. C. More and Capt. W. E. Duckering) 183
Production and patience e298
Effect of, on living cost graphically shown n443
Professional men and women, movement for unity e782, 808, n835
Professional prestige e751
Professionalism, common basis of....e782, 808, n835
Providence Engineering Society increases membership 62% by drive..... 958
Public and the engineer (C. Hansel)..... 646
Public comfort station law in Wisconsin.. 121
Public Health, see Sanitation.
Public Health Service engineers, etc., discrimination against e153
Public Service Corps proposed in Congress n392
Public utilities commissioners to meet....n633
Public utilities, effect of deferred earnings on capital value (J. R. Bibbin).....a*947
Public utility valuation, principles underlying 425

PUBLIC WORKS DEPARTMENT, see DEPARTMENT OF PUBLIC WORKS

Public works, Federal, for 1921, $284,000,000 for.....n902
Publicity work: Manufacturers' Publicity Bureau issues monthly n151
Pumping station undermined by leaks and shut down *941
Pump well of Pearl Harbor dry dock a large unit (R. W. Gaylord).....*861
Pump well, precast concrete, set in 12 feet of water *954

PUMPS AND PUMPING

Cost reduced 30% by test at Grinnell, Iowa a18
For small water-works, selection of....a429
Suction, used to explore gravel deposits for concrete aggregate h532
Training partition in canal inlet increases capacity *922
Puyallup River, Washington, additional money for control recommended.....n689
Pyramids, penetration of soft clay by, tests made 946

Q

Quartermaster's Office, civilian construction employees get bonus n394
Queenston-Chippawa power development, construction progress e973 *1010
Construction railway fill made by caterpillar steam shovel.....h*1028
Dredge scows to be emptied, let down Niagara River on lines *1075
Power canal, danger sign on high-tension wires n*832
Power canal makes wells dry up.....n839
Quense, J. H., and T. H. Carver, on tests of concrete in tension *1005
Quicksand and watery gravel, foundations in *414

R

Rack, simple, files many prints (C. P. Rumpf) h*531
Radiators outside on oil-driven draglines secure cooler air and save space.....h*440
Radicalism, Massachusetts against.....e685
"Railroad Executive," on Federal railroad operation and betterments policy 615
On upkeep of railways under Federal control 457
Rails, see Railways, Rails.

RAILWAYS

Alaska, Colonel Mears chairman of commission n340
Timber bridge problems *420
And motor trucks, for freight transportation e2, e50; (C. W. Baker) 52; (W. Jackson) letter 434; (J. Wilkes) letter 829
Ashpit, double-track, water-type, Pennsylvania R.R. *408
Ashpits of new design *1007
Box-car shortage due e153
Canadian Pacific plans extension of Kipawa branch n839
Canadian Railway Association formed...n837
Canadian Railway War Board abolished.n837
Construction, fill, made by caterpillar steam shovel h*1028
Control:
Analysis of Esch bill (E. E. Denison). 885
Brotherhoods' plan e249, n290, n340
Canadian operation shows loss.....n148
Commission to fix wages proposed...n533
Comparison of various bills 874
Cummins bill n485
Cummins bill to be passed n1029
Cummins bill passed by Senate....h1077
Esch bill, analysis of (E. E. Denison) 885
Esch bill passed by House.....n745
Essentials of problem e493
Executives ask emergency law.....n836
Federal operation and betterments policy (Railroad Executive)..... 615
Federal purchase at fair value 820
Grand Trunk, opposition to purchase by Canadian Government ...n715, n745
How will Congress determine railways' future? (L. C. Fritch)..... 17
Nationalization discussed at Am. Soc. C. E. meeting n775
Operation by brotherhoods e290
Orderly progress e297
Plan for private operation of Federalized railways (W. J. Wilgus), 496, e592, 820
Plan to finance Federal purchase (G. Lindenthal) 504, e592
Plumb plan.....e249, n290, n340, *405
Plumb plan, protest against.....n393
Plumb plan, Council of American Institute of Consulting Engineers protests against *405
Plumb plan supported (T. Flynn) letter 479
Private vs. Government ownership...e592
"Railway Problem, The," (C. W. Baker), article announced....e719, e749, 752, e783, 789
Railways may not be returned at beginning of year n967
Referendum vote of Chamber of Commerce of United States.....n292
Return by Jan. 1 seems certain.....n715
Security owners ask guaranteed return n486
Self-supporting roads advocated before House committee n442
Undermaintenance under Federal control e448, 457
Values versus capitalization.....e589
Crossings, bituminous paving 696
Sectional, removable, concrete-slab...*473
Delaware, Lackawanna & Western trainshed, Hoboken, N. J., raised without traffic interruption *460
Ditching, cost of 700
Embankments: opening old fill reveals reasons for track trouble (R. Reimann) *126
Engine terminal improvements, Pennsylvania Lines West *24, 163
Fill, opening old, reveals reasons for track trouble (R. Reimann).....*126
France, local, narrow gage recommended for 221
Transitory protection measures asked by 890
Grade crossings, accident-prevention highway signs (A. L. Wyman) letter 94, (H. G. Butler) .....letter 286
Grade crossing elimination, Indianapolis. 966
International Railway Congress dissolved; reorganized as International Railway Association n837

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Light, Army's practice in France (P. McGeehan) *635
Light, benefits Arabian port..... 503
Maintenance and track labor, economics of 697
Mexican, suffer heavily by storms..... 955
Maintenance under Federal control..e448, 457
Narrow-gage; operation at munition plant (Lieut. J. A. Silsbee) 127
New Haven stockholders seek limited receivership n1030
New York Central, concrete conduit for track wires *1055
Passenger train resistance tests 1017
Pennsylvania Lines West, engine terminals at Logansport and Richmond, Ind..*24, 163
Rails:
Cracks in steel e2, a15; (C. W. Gennet, Jr.) .....letter 193
Failures in 1918.....1052
Joint simulates continuous rail (W. M. Pegram) .....letter *829
Old and new compound, of same type e298; (S. D. Williams, Jr.)..letter *336
Practice in gaging e2; (C. W. Gennet, Jr.) .....letter 193
Thermit-welding and hardening in place, Leeds, England *83
Railway Association of Canada formed..n837
Resurvey, curve chart for (J. G. Wetherell) *506
Salt Lake and Denver project revived..n443
San Diego and Arizona open n1033
South American and the United States.. 165
Street, gages and wagon gages..... 328
Latest British track construction.... *83
Pittsburgh, elements of value in.... 807
Valuation, elements in Pittsburgh case 807
Survey; another chart of railway resurvey (H. P. Boardman).....letter *898
Swiss, to extend electrification..... 220
Ties, preservation e106
Soaking in Salt Lake increases life... 944
Track:
Creepage stopped on heavy grades of logging railroads 940
Elevation on Indianapolis Union R.R..*265
Labor and railway maintenance..... 697
Ladder, renewal of.....1012
Material, heavy, machines for handling n1061
Support, concrete 165; (A. C. Irwin). letter 333
Trouble revealed by opening old fill (R. Reimann) *126
Track wires, New York Central RR., concrete conduit for *1055
Trainshed, Hoboken, N. J., raised without traffic interruption *460
Turntable, 110-foot, with adjustable center 370
Turntable reinforced by trussing to carry heavy engines 1014
Undermaintenance ("Railroad Executive") e448, 457
Union station rebuilt, Indianapolis, with interrupting traffic..... *84
Upkeep under Federal control (Railroad Executive) 457
Valuation:
Cost of work to August, 1919.....n340
Developing prices for Federal valuation (H. J. Saunders)..... 930
Interstate Commerce Commission report n1079
Plumb plan arouses new interest in..n340
Report to be ready January, 1922....n837
Value versus capitalization e589
Wage board, permanent, urged.....n533
Wages, commission proposed.....n533
Water supply to, ruling against discriminatory rates to railway 115

RAINFALL AND RUN-OFF

Excessive, at Manila 677
Graphical method for estimating storm-water run-off (R. W. Horne) *282, corrections 410
Heavy rain destroys sewer and railway at St. Louis (W. W. Horner) *958
More accuracy needed in collecting data (J. B. Lippincott and R. E. Horton)..... letters *830
Gages, method of Weather Bureau's use criticized (J. B. Lippincott and R. E. Horton) .....letters *830
Records at Muscatine, Iowa..... a71
Randolph, I., on national Public Works Department vs. Corps of Engineers..... 561

RAPID TRANSIT

Centralization of city traffic.....e154, *170
Cleveland, Ohio, street-car loop subways. e105, e154, *170
Pittsburgh underground street-car loop..e105
Rapid Transit Engineers' Association, New York, meets n46; votes for unionization .n147
Reactions in continuous girders, mechanical method for determining (R. Fleming)..*428
Reclamation Service needs $262,000,000..n880
Record Year's work in..... 853
Reconstruction, French, a new view on..e685
Red Cross Division of Sanitation headed by Prof. G. C. Whipple and Col. F. F. Longley n777
Rees, B. L. G., on topographical surveying on Chilean desert *224
Reichardt, W. F., on resources of contractor saves labor.....h*712
Reimann, R., on opening old railroad fill reveals reasons for track trouble.....*126
Rensselaer Lake, dam and reservoir without spillway 713
Repairs, data on e639
Report form for water-treatment plants, Wisconsin *189

Page

RESERVOIRS

Concrete, groined arches or flat roof for 566; (T. C. Atwood) .....letter 673
Floor partly supported on concrete arches *1062
Herron Hill, Pittsburgh, to be relined.. 668
Lining reservoir with concrete by cement gun (E. C. Eaton) *167
Open, sanitary effect of water storage in (A. Wolman and S. T. Powell).....*804
Rensselaer Lake, without spillway 713
Roofs, groined arches or flat 566; (T. C. Atwood) .....letter 673
Spillway capacities for reservoirs in Western United States (J. T. Whistler) *28
Responsibility for water-main break damages 944
Retaining wall, crib, concrete I-beams used to make *651
Retaining wall section, unusual concrete has raised heel (R. C. Chaney).....*621
Rhine bridged by American Army engineers in record time (Capt. J. M. Farrin and Lieut. S. H. Andrews).....*118
Ribs, steel, on wide concrete-finishing belt prevent warping h*712
Richards, A., on test of sandy foundations at arch bridge pier.....*208
Richart, F. E., on deflection of continuous beams and rigid frames *564
Richmond, Ind., engine terminal.....*24, 163
Rig used to sound under piers (R. W. Bentzmuller) h*1075
Rio Grande River, lower, floods on, in New Mexico and Texas (A. J. Henry) 1001
Riprap, toe of, held on slopes by wood crib h*899
Risdon, P. J., on English Channel train-ferry bridge of 120-ft. span.....*666
River and harbor estimates for next year.. 919
River control, additional money recommended (Puyallup, Stuck and White Rivers, Washington) n680

RIVERS

Bank protection, Kaw River, Kansas, and Savannah River, Georgia *410
Erosion of bank of Yakima River prevented by cribbing 624
Floodgates proposed for control of Savannah River (E. C. Garvin).....*873
Floats show course of currents.....*119
Ohio, present status of improvement.....*952
St. Lawrence, improved favored by Canadian Waterways convention.....n967
Report to appear soon.....n1031
Stream flow in France, seasonal utilization of (E. H. Sargent) *462
Terminal, small, for widely varying water stages (H. Abbott) *999
Under many jurisdictions.....n198
Riveted butt joints, design of, after Schwedler assumptions *765
Rivets as compared with bolts in steel-frame buildings (R. Fleming) *316, e298, (W. E. Belcher) .....letter 529
Rivets, electric heater.....n*908
Experience with bolted steel structures (H. B. Tabor and E. D. Coddington) letters 896
Roadmasters' and Maintenance-of-Way Association meeting n631

ROADS, see HIGHWAYS

Robinson, H. F., on duty of water in irrigation *355
Rogers, M. A., on road construction in West Virginia mountains *90
Rolls, wood, under excavator, replaced by pipe h*337
Rondout Creek bridge design condemned for excessive load on batter piles *329; (W. E. Belcher) .....letter 479
Roof, flat, or groined arches for concrete reservoirs 566; (T. C. Atwood)...letter 673
Roof-beam, factory, failure of, and "Compression" wood (G. E. Heck).....*508
Rope, new, injured by improper winding on engine drum h832
Wire, empiric formula for strength.... 560
Roscoe, A. P., on overhead and time cost of pit and trench excavation.....e50, 89
Roumania, engineering and construction prospects in (R. S. Doman) 925
Roumanian bridge wrecked during war..*182
Roundhouse, new, with full-length smokejacks 758
Ruegnitz, W. C., on camp beds and bedding reduce labor turnover.....e202, 213
Rumpf, C. P., on simple rack files many prints h*531

RUN-OFF, see RAINFALL AND RUN-OFF

Russia, droughts in; diagram to show probable droughts (V. V. Tchikoff)....*554
Rutland, Vt., water-supply chlorinated.... 655

S

Sabin, L. C., lock at Sault Ste. Marie named for n678
Sacramento, Calif., bonds for water-filtration plant about to be issued n244
To have municipal filter plant.....n535

SAFETY

Accident-prevention instructions for workmen n99
Congress to be held.....n535, e539
Highway spurs at grade crossings (A. L. Wyman)....letter 94, (H. G. Butler) letter 286
In steel erection (Col. E. A. Gibbs)....a801
Ladders, slope and incline..... 78
National Safety Council, Construction Section, discusses business at breakfast.....e782

Page

Safety engineering reduces cost of construction..... 864
Sign on high-tension wires, Queenston-Chippawa power canal.....h*832
Suggestions for builder h1027
Traveling cranes, operation..... 471
Salaries Federal, reclassification.....e590, 622
Salt Lake and Denver railway project revived n443
Sand and gravel produced in 1918..... 867
Sand for winter use.....e638
Removed from canal by sluicing 998
San Francisco drops 77 engineers from city's payroll n585
Wins suit to protect water rights.....n442
Sanitary engineering section, American Public Health Association, meeting.....n488
Sanitary engineers recently in service need positions. n441

SANITATION

Canada, new health department..... 36
Civil engineering and public health (R. J. Harding) 920
Closet, camp, with septic tank.....h*97
Discrimination against Public Health Service engineers, etc.....e153
Division, Red Cross, headed by Prof. G. C. Whipple and Col. F. F. Longley..n777
Folding portable dry closet.....h*146
Health-district act, Ohio 1067
"Healthmobile," New York State..... 72
Heavy decline in typhoid since 1900.... 39
Influenza and typhoid in Army camps (Maj. G. A. Soper *72
New York State "health mobile"..... 74
Ohio health-district act 1067
Pneumonia and influenza in Army camps (Maj. G. A. Soper) *72
Press bulletin service on public health, established by University of Illinois.. 892
Public comfort station law in Wisconsin. 121
Sanitary engineer as health officer (E. G. Sheibley)....letter 526, with editorial comment
Sanitary engineer for Newark, N. J., employment is advised n1082
State department of health, essential functions of 1002
Typhoid and suicide deaths..... e49
In New York City, decline in..... 827
Various current phases of sanitary engineering. 882
Vermont organized into health districts.. 645
Wisconsin Health Board, wider powers for 231
Sargent, E. H., on long-term variation in flow of Hudson River.....*360
On utilizing differences in seasonal stream flow in France *462
Saunders, H. J., on developing prices for Federal valuation of railroads..... 930
Savannah River, Georgia, bank protection..*410
Control of floodgates proposed (E. C. Garvin) *873
Saville, T., and C. L. Weir, on Langley Field sewage-treatment works....*374, correction 402
Sawkins, J. H., on knuckle guard for wheelbarrow handles h*1074
Sawkins, J. H., on traversing by a 36° angle method...*373, (K. F. Jaeger) letter 580; (C. B. Schmeltzer) letter 772; (G. F. Schlesinger) letter 828 .....
Scarsdale, N. Y., sewer-construction records used at (P. Thompson).....n111
Schmuck, W. P., on construction labor's instability 813
Schoharie development, New York water-supply, involves dam and 18-mile tunnel (J. W. Smith) a*824
Schwedler assumptions, design of riveted butt joints after.....*765
Scott, L. C., on depressed permanent bench marks set in concrete floors.....*365
Scour in drainage channel, long board mattress sunk to prevent.....*230
Scrap, keeping it cleaned up saves money (A. S. Fry) h390
Sea wall, Galveston, extending (J. B. Lippincott) *617
Searles, "Field Engineering," error in tables (A. Llano) .....letter 962
Seattle advances pay of city employees... n46
Engineers protest against city's pay..n631
Gunny bale handling by stacking elevator *855
Vegetable oils, handling at Port of Seattle e201, *204
Seelye, T. F., on what will engineers pay to improve their status?..... 722
"Selma," concrete ship launched..... n99
Septic tank royalties, claims settled by towns and cities.....n714
Service charge for water defined..... 809

SEWAGE

And dissolved oxygen in New York harbor (K. Allen).....*228
Grease, recovery from sludge.....e910, a948
Oxygen, dissolved, in New York harbor (K. Allen) *228
Recovery of valuable products from. e910, a948
Sludge, recovery of grease from..e910, a948

SEWAGE-DISPOSAL

Madison, Wis., difficulties at.....*510

SEWAGE TREATMENT

Activated-sludge plants in Texas..... 920
Austin, Tex., new works *1066
Canning-plant wastes in Wisconsin, treatment of (E. J. Tully) *1017
Chicago, lake-water diversion and sewage treatment 231

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Cleveland westerly works, contract let... n44
"Direct-oxidation" process at Easton, Penn....e541, *569, (K. Allen) letter 1026
Easton, Penn., tests of lime-electrolytic-agitation process....e541, *569, (K. Allen) letter 1026
Electrolytic, not yet established....e541, *569, (K. Allen) letter 1026
Factory wastes, control over, in Wisconsin 159
Houston, Tex., sludge-dewatering tests e973, 1003
Imhoff tanks and percolating filters for Worcester, Mass.....n246
Imhoff tanks for Worcester, Mass..... 796
Landreth "direct-oxidation" system studied....e541, *569, (K. Allen) letter 1026
Langley Field, Virginia, works (T. Saville and C. L. Weir)....*374, correction 402
Lime-electrolytic-agitation process at Easton, Penn....e541, *569, (K. Allen) letter 1026
Midwaukee testing station, experimental data 1063
Oxidation process, direct, at Easton, Penn...e541, *569, (K. Allen) letter 1026
Percolating filters and Imhoff tanks for Worcester, Mass.....n246
Report forms and testing apparatus (E. J. Tully and J. H. Mackin).....*825
Sludge-dewatering test, at Houston, Tex. e973, 1003
Testing apparatus and report forms (E. J. Tully and J. H. Mackin).....*825
Septic tank royalty claims settled.....n714
Vermont..... 655
Washing sewage-filter gravel at Clinton, Mass..... 763
Wider powers for Wisconsin Health Board..... 231
Worcester, Mass., Imhoff tanks and percolating filters.....n246

SEWAGE WORKS

Phillipsburg, N. J., works conditionally authorized.....n584

SEWERS

Backfiller, improvised, cuts costs on Panama job (R. C. Hardman).....h*834
Construction records used at Scarsdale, N. Y. (P. Thompson).....*111
Interconnections made compulsory in Wisconsin..... 267
Kansas City, Mo., Turkey Creek sewer contract for Canadian contractor.....n535
Labor-cost increase of 540 per cent.... 621
Louisville, Ky., new sewerage board; to have more sewers.....n837
Milwaukee commission remains unchanged.....n99
Multiple outlet provides for variable flow (S. T. Smetters).....*728
Open-cut, earth slips prove disastrous to *989
Passaic Valley, outfall tunnel section contract again abandoned.....n147
Steam shovel digs trench in narrow space (G. C. D. Lenth).....*1064
Storm, diagram adaptation of rational method of design (H. G. McGee)....*868
Shaw, A. M., on state and Federal control of land drainage needed..... 523
Sheet piling, steel, bridges trench.....h242
Shenehon, F. C., proposed regulating discharge of Lake Ontario.....n678
Shepherd, R. B., Jr., on what will engineers pay to improve their status?..... 720
Sherlock, C. C., on sunstroke and lightning as viewed by compensation commission.. 403

SHIPBUILDING, SEE SHIPS AND SHIPBUILDING

Shipping Board reconstituted.....n340

SHIPS AND SHIPBUILDING

American ships built since armistice.... 812
Chicago to Liverpool by steamer..... n43
Concrete:
"Atlantus," first government concrete ship, commissioned.....n441
Barge sinks at dock.....n292
Barge survives launching at Singapore *361
"Cape Fear," government-designed, launched.....n*291
Design, problems in (J. Glaettli).....a273
French tests of concrete..... 821
Medal presented to W. L. Comyn for building first concrete ship.....n*100
Navy barge side-launched.....*309
Precast members used for British barges.....*507
Recording strain-gage (strainagraph) to measure stresses..... a89
"Selma" launched..... n99
Tests of tanks for oil storage..... a16
Decrease of 25% in United States shipbuilding.....n148
Fabricated-ship plant planned for later general use (M. E. Allen)..... *79
Fleet Corporation delivers 30 ships in week.....n393
Fore River, equipment and methods *19, *362
Heavy double trestle for building cranes (R. W. Burpee).....e717, e718, *723
Launching ways, concrete pontoons form water end of.....*432
Launchings, experimental study of side launching by Fleet Corporation..... 236
Merchant fleet now exceeds 8,000,000 tons.....n681

Page

Mobile Shipbuilding Co., fabricated-ship plant planned for later general use (M. E. Allen).....*79
Progress told by naval architects and engineers.....n777
Shipbuilding program, new, proposed....n968
Steel, 19, sold by Shipping Board.....n100
Stresses, new data on.....*550
United States may build largest ocean steamships.....e201, n243, e297
Yards, Chester Co. and Merchant Corporation consolidate.....n341

Shipyards consolidate, Chester Co. and Merchant Corporation.....n341
Shore protection, steel spur dikes for.....*410
Shovel, steam, digs sewer trench in narrow space (G. C. D. Lenth).....*1064
Shovel, traction steam, crosses railroad bridge (H. P. J. Earnshaw).....h*773
Silsbee, Lieut. J. A., on narrow-gage railway operation at munition plant..... 127
Sinking long board mattress in narrow channel.....*230
Siphon, water, under river a difficult job.. 818
Skillin, E. S., on construction labor's instability..... 876
Slater, Mo., ruling against discriminatory water rates to railway..... 115
Slater, W. A., on some tests of properties of reinforced concrete.....*217
Sliding hillside at Cleveland, Ohio.....*164
Smetters, S. T., on multiple outlet provides for variable sewage flow.....*728
Smith, Prof. G. E. P., on concrete pipe fails from unequal expansion of shell.....*113
Smith, J. W., on Schoharie development involves dam and 18-mile tunnel.....a*824
Smoke problem, Chicago, civic more than engineering.....n101
Smokejacks, full-length, in new roundhouse 758
Snow fields, determination of water-supply from.....*766
Snowslides, protection of viaduct from, by concrete walls (E. E. Adams).....*470
Social theorist, the.....e590
Socialism, bankruptcy of.....e589

SOCIETIES (see also names of individual societies).

Activities in Chicago.....n634
California state council in process of formation..... 284
Chicago, activities.....n634
Committees, on what shall they work?..1069
Comprehensive organization indorsed by District of Columbia Association, Am. Soc. C. E.....n1081
Development committees' conferees meet..e345
Dues, differing views on.....e909
Duluth Engineers' Club questions members concerning legislation..... 93
Founder societies and American Association of Engineers.....n966
India, engineers to unite in single society, n840, dues, e909
Joint Conference Committee's report on unification.....n835
Kansas City Engineers' Club to get city growth data on which to base civic opinion..... 93
List, new, prepared by *Engineering News-Record*.....n442
Local, membership and functions, C. W. Hunt on....e50, a87 (K. B. Knudsen) letter 237
Local council idea spreads on Pacific coast..... 894
Milwaukee society has active civic affairs committee..... 93
National Engineering Council scheme of organization (L. B. Smith)....letter 190
New Engineering Council or American Association of Engineers? (K. B. Knudsen).....letter 237
Paramount problem is unity..... 894
Professional prestige.....e751
Publicity bureau for each local association suggested (R. E. Spear)....letter 433
Publicity contest carried on by American Association of Engineers.....*959
Union—not confederacy—future strength of profession (H. B. Smith)....letter 1024
Voting membership qualification in local societies....e50, (C. W. Hunt) a87

Society for the Promotion of Engineering Education convention and report....e3, 643
Society of Terminal Engineers asks consideration of new pier handling methods at New York.....n680
Sohier, Col. W. D., resigns from Massachusetts Highway Commission.....n968
Soil exploration by pipe sounding (R. C. Chaney).....h*439
Soil problems studied.....e1037, *1040
Soil test, at sandy foundations at arch bridge pier (A. Richards).....*208
Soldier settlement bill reported in House..n290
Soper, Maj. G. A., on influenza and pneumonia in Army camps..... *73
South American railways and the United States..... 165
Southwestern Water Works Association, convention..... n42
Not to join American Association..... n42
Spain, high-tension transmission lines 352
Specifications, government, should not misplace responsibility (E. D. Buel) letter 144, (S. W. Barakat (letter) 285
Responsibility for (W. P. Bullock) letter. 388
Spillway, dam and reservoir without..... 713
Splice for wood trusses not affected by shrinkage.....*934
Sprinkler and flusher, street, semi-trailer, with detachable tank.....n*101

St. Lawrence River, improvement favored by Canadian waterways convention.....
Joint study started.....
Report to appear soon.....

ST. LOUIS, MO.

Contractors join Associated General Contractors of America.....
Garbage disposal.....
Municipal bridge subject to Illinois taxation.....
Municipal dock, work progressing on.....
Municipal engineers receive increase.....
Sewer and railway destroyed by heavy rain (W. W. Horner).....
Zoning ordinance amendments (H. Bartholomew).....
St. Paul increases tax limit.....
Municipal savings bank.....
Stack, steel, tilted onto base by improvised derrick.....h*337
Stacking elevator simplifies freight handling.....*855

STANDARDS

Engineering Standards Committee proposes new constitution.....575
Proposed reorganization.....e106
New, for materials adopted by American Society for Testing Materials.....n583
Standardization, paternalistic.....e782
Standpipe, steel, at Chicopee, Mass., subject of suit.....e1039, 1053
Starrett, Col. W. A., on "Building for Victory".....139
State department of health, essential functions of.....1002
State engineer's right to practice..... 365
Steam pipe replaces wood rolls under excavator.....h*337
Steam shovels, endless-track arrangement for carrying away at (D. J. McFadden) h*484
Stearns, F. P. appreciation of (A. Hazen).n*904

STEEL

Chrome-nickel and nickel, comparative endurance....a*82 (H. F. Moore and A. G. Gehrig) letters 389
Cracks in rails....e2, a15, (C. W. Gennet, Jr.) letter 193
Effect of copper in reducing corrosion.. a14
High-speed, compositions and efficiencies a120
Nickel-chrome, brittleness in.....1020
Oxygen in..... 940
Tests:
Brittleness in Nickel-chrome steel....1020
Chrome-nickel and nickel, comparative endurance....a*82 (H. F. Moore and A. G. Gehrig) letters 389
Columns, further tests.....e202
Compositions and efficiencies of high-speed steels.....a120
Effect of copper in reducing corrosion. a14
Exposure tests on steel sheeting..... 521
Oxygen in..... 940
Steel erection, safety in (Col. E. A. Gibbs) .a801
Steel spur dikes for shore protection.....*410
Steelwork for buildings, common errors in detailing (E. Godfrey), *730; (L. C. Jordan) letter 961; (G. Paaswell) letter 962
Stevens, J. C., on what will engineers pay to improve their status?..... 722
Stockyards waste, Chicago, cost of treatment.....n487
Stock pile in street protected by curb....h628
Stone sizes standardized.....n967
Storm, tidal, at Corpus Christi, Tex., and effect on engineering structures (T. Bartlett).....*848
Strainagraph, to measure stresses in concrete ships..... a89
Strainer, duplex, for water or oil.....n*344
Street-cleaning equipment, Albany, motorized.....*762
Street Railways, see Railways, Street.
Street sprinkler and flusher, semi-trailer, with detachable tank.....n*101

STREETS, SEE HIGHWAYS, STREETS

Stresses, repeated, broader use of Johnson's formula for (Prof. J. B. Kommers).....*942
Ship, new data on.....*550
Strikes, see Labor, Strikes.
Stucco, how to make..... e2
Stuck River, Washington, additional money for control recommended.....n680
Students' Army Training Corps, cost of training..... 357
Subways, Philadelphia, new construction methods.....e297, *300
Pittsburgh.....n586
Successful Methods—a Magazine of Construction Service, issued by Manufacturers' Publicity Bureau.....n151
Suicide deaths, same rate as typhoid.....e49
Sun shields, canvas, light arch supports for h*1074
Sunstroke and lightning as viewed by compensation commissions (C. C. Sherlock) 403

SURVEYS AND SURVEYORS

Astronomy for (book review)..... 891
Bridge and culvert, Iowa..... 140
"Common surveying," and engineers' unrest (C. T. Johnson).....letter 94
County, replaced by county engineers in California.....n197
Farm, uniform practice needed (R. T. Childs).....letter 1072
Illinois license law.....n441
Indexing plan for county surveyors (K. Q. Volk).....*283

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.

Page

Plane-table or transit for topography? letters on (H. Wood) 95; (F. Vernon, K. Allen and F. J. Howes) 333, 334; (E. Low) 434; (W. Brown) 673
Railways, resurvey, curve chart for (J. G. Wetherell) *506
Railway: another chart for railway resurvey (H. P. Boardman) ....letter *898
Sextant and stadia-rod method for measuring distance (B. A. Baird) 647
Targets, special, facilitate survey of flood works (R. C. Chaney) *768
Texas license law 315
Topographical, on Chilean desert (B. L. G. Rees) *224
Transit or plane-table for topography? letters on ....(H. Wood) 95; (F. Vernon, K. Allen and F. J. Howes) 333, 334; (E. Low) 434; (W. Brown) 673
Traversing by a 35° angle method (J. H. Sawkins) ....*373; (K. F. Jaeger) letter 580; (C. B. Schmeltzer) letter 772; (G. F. Schlesinger) letter 828
Swart, H. V., on criticism of contract-bond business 669
Sweden, large exports of timber from..... 847
Water-power development 471
Swimming tank on third floor of concrete building (L. R. Viterbo) ....*135, (J. S.) letter 287, (M. D.) letter 437, with editorial comment
Switches, split-switch turnout, method of laying out (L. C. Scott) .....letter 711
Switzerland, railways to extend electrification 220
Symonds, H. A., on selection of pumps for small water-works.....a429

T

Tables and curves, mechanical device for reading *644
Tallahassee, Fla., to have manager..... n836
Tanks, concrete for fuel-oil, design and construction a322
Three large steel, moved 150 miles by water (A. J. Taylor) *226
Tape, steel, readings corrected for sag and stretch (W. S. Weeks) *404
Taylor, A. J., on moving three large steel tanks 150 miles by water *226
Tchikoff, V. V., on method of constructing diagram to show probable droughts.... *554
Teele, R. P., on irrigation in fourteenth census 926
Telegraph and telephone systems returned to owners n290
Telegraph, printing, valuable during war.. 227
Telephone and telegraph systems returned to owners n290
Templet used in clearing sand from irrigation canal 800
Terminal, small river, for widely varying water stages (H. Abbott) *999
Test hole in tidewater drilled by land drill on barge (A. J. Newman) h*899

TESTS, see also CONCRETE, TESTS; STEEL, TESTS, Etc.

Blasting, show TNT stronger than 40% dynamite h145
Cast iron, malleable, properties of..... *132
Castings, X-ray examinations for blowholes 234
Exposure, on steel sheeting 521
Floor, tile and concrete flat-slab..... 933
Gypsum, structural 852
Materials ..... el
Motor truck impact on roads five times dead load a*573
Resistance of soft clay to penetration by pyramids and piles 946
Road, thin-base monolithic-brick road tested (H. H. Edwards) *134
Rope, wire 560
Ship stresses *550
Recording strain-gage..... a89
Soil for foundation, at arch bridge pier (A. Richards) *208
Steel, see Steel, Tests
Stresses, ship *550
Wheel loads on highway bridge loads (H. F. Blood) ..... letter 190
Wires, mirror extensometer for testing.. a*32
Wood, strength of long-used and freshly cut Douglas fir compared..... 281
Wood-stave pipe line, leakage test (V. M. Crown) *264
Yellow-pine beams, tested for shear with concentrated loads (L. R. Manville and C. R. Hill) *69, (H. D. Dewell) letter 388
Texas, activated sludge plants in..... 920
Road building materials in..... n290
State highway engineer to be highest paid state official n1081
Texas Association of Contractors n99
Thompson, P., on sewer-construction records at Scarsdale, N. Y. *111
Timber, see Lumber
Timber bridge problems on Alaska railway. *420
Time, lost, reduced by shifting crews (A. S. Fry) h145
Tires, methods used by Germany in overcoming shortage (H. M. Kistler)..... *701
TNT stronger than 40% dynamite h145
Toggle relieves load on bridge posts during reinforcement work h*743
Tolles, F. C., on garbage collection and disposal at Akron, Ohio 1013
Tomlin, Capt. R. K., Jr., returns to editorial duties n290
Tower, concreting, 140-foot, raised in one piece (S. S. Hammel) h*242
Towers, wind pressures and wind stresses in design (R. Fleming) *660
Tracings, Janney process for reproducing improved n844

Page

Tractor engine operates plant during coal crisis n*1036
Tractors haul gravel in Minnesota *227
Track-laying tractor crane of Ordnance Department n*396
Tracy, J. C., on reorganization at Yale.... 186

TRADE, FOREIGN

Chamber of Commerce of United States conference postponed n680
Dutch East Indies, construction opportunities in (J. W. Evans) 497
Exports for June break all records.... n248
Handbook on export methods issued by Government n843
International Trade Conference to be held n343
Resumed with Germany and some other countries n151
Trailer, device for lifting and coupling..n*972
Train-ferry bridge English Channel (P. J. Risdon) *666
Trainshed, Hoboken, N. J., raised without traffic interruption *460
Transfer bridge, 200-ton, moved on pontoons *478
Transit, long-range 818
Transit or plane-table for topography? letters on (H. Wood) 95; (F. Vernon, K. Allen and F. J. Howes) 333, 334; (E. Low) 433; (W. Brown) 673
Transportation monographs by C. W. Baker. e781
Traversing by a 35° angle method (J. H. Sawkins) *373, (C. B. Schmeltzer) letter 772
(K. J. Jaeger) .....letter 580
(G. F. Schlesinger) .....letter 828
Trinitrotoluene stronger than 40% dynamite h145

TRUCKS, see MOTOR TRUCKS

True, G. W., on concrete shipping pier at Panama has novel design *912
Trusses, wood; splice for, not affected by shrinkage *934
Tufts College engineering school, changes at (G. C. Anthony) 185
Tully, E. J., and J. H. Mackin, on sewage-treatment report forms and testing apparatus *825
Tully, E. J., on treatment of canning-plant wastes in Wisconsin *1017
On treatment of gas waste to prevent water pollution *917

TUNNELS

Backfilled through holes bored from surface (J. Armstrong) *174
Colombia, S. A.: American contractors invited to bid n969
East River holed through n339
Hudson River:
Congress authorizes state agreement.. n98
Interstate agreement on n678
Proposed types *422
Irrigation, 14-mile, may be built in Washington n196
Pennsylvania R. R., damaged by gasoline fire 110
Turbines, large Francis-type 355
Turnbuckle adjustment for hammer clutch (E. E. Glass) h899
Turntable, 110-foot, with adjustable center 370
Turntable reinforced by trussing to carry heavy engines *1014
Twenty-third Engineers, returned units .. n45

TYPHOID

And suicide deaths e49
Heavy decline since 1900 32
In New York City, decline in 827
Moline, Ill., outbreak e106

U

Uhler, W. D., on does rich concrete in roads crack more than lean? e491, 518
Underground structures, electrolysis in ... 798
Underwood, Senator O. W., advocates permanent railway wage board n533
Union of Technical Men, New York Local, makes pay demand n486
Unionism, American Association of Engineers' attitude on..... n903
Unit costs for use in public utility appraisals (R. L. Baldwin) *514
United Engineering Society pays tribute to Carnegie n394
United States Coast and Geodetic Survey, map making work n341
United States Housing Corporation report. 578
United States Shipping Board, see Shipping Board
University of Illinois establishes press bulletin service on public health 892
Salaries of instructors critized (C. H. Fuller ..... letter 435
University of Iowa, engineering fundamentals for four-year course (W. G. Raymond) ..... letter 959
University of Michigan offers highway engineering fellowships n679
Utah counties unite in water-storage study n535
Utica, N. Y., garbage collection and disposal *810
Utility, public, appraisals: unit costs for use in (R. L. Baldwin) *514

V

VALUATION

Elements in Pittsburgh street-railway case 807
For rate regulation (W. G. Raymond) ..... letter 332
Land valuation case, Kansas City Southern R.R. case before Supreme Court n1030

Page

Principles underlying determination of "fair value" 425
Public utilities, unit costs for use in (R. L. Baldwin) *514
Railways:
Developing prices for Federal valuation 930
Report to be ready January, 1922.... n837
Washington, D. C., street railways, completed n535
Valve, bypass, faulty, cause of typhoid outbreak, Moline, Ill. e106
Home-made, quick-opening for small tanks (D. J. McFadden) h*713
Vannier, G., Canadian architect, gets contract for French house rebuilding..... n149
Veenhuyzen, J. C., on good roads pay for themselves twice every year e201, 214
Venturi meters, computation of co-efficient of discharge (W. S. Pardoe) *606
Vermont organized into health districts.... 645
Water and sewage treatment 655
Viaduct, Lehigh River, at Bethlehem, Penn., cost apportioned among eight parties n970
Viaduct protected from snowslides by concrete walls (E. E. Adams) *470
Viterbo, L. R., on swimming tank on third floor of concrete building, *135; (J. S.) letter 287; (M. D.) letter 437 with editorial comment
Volk, K. G., on land-survey indexing plan for county surveyors *283

W

Wagon gages and street-railway gages..... 328
Wall, concrete, construction is continuous process *454
Walla Walla, Wash., reservoir, construction postponed; contractors refuse to bid save on cost-plus basis..... n534

WAR

Airplanes, and gas warfare..... e591
Bridges e448
Bridges in active warfare (L. E. Moore and M. W. McDonald)...e687, *688, *734
Engineer casualties third highest..... 576
Engineering designs in peace work..... e448
Factories to be sold by War Department n197
Gas and aircraft warfare..... e591
War Department, road-building equipment, bills for transfer n678
War Labor Board ends..... n339
Warwick, C. L., new secretary-treasurer American Society for Testing Materials .. 9
Washington, D. C., bill to limit height of buildings, etc., and for zoning, passed by House..... n584
Street-railway valuation completed..... n534
Zoning for..... n339
Waste, stockyards, in Chicago, cost of treatment n487
Wastes, factory, control over, in Wisconsin 159
Water, boiler, treatment..... a323
Water-gage fluctuations damped by diaphragms 613
Water-hammer in penstocks and economy of design (E. Crewdson and A. H. Reeves) ..... letters 437
What causes? (B. Gibson) letter 530; N. B. Skeetzer) letter 710; (W. P. Bullock) letter 828

WATER-POWER

And the coal strike e973
Bill passed by House of Representatives n147
Development in Sweden..... 471
Eastern Ontario Hydro-Electric Municipal Union formed n970
India, studies in..... 263
Large Francis-type turbines..... 355
Legislation hangs fire..... n101
Ontario, work in..... 390
Problems of small town, solution of.... *650
Senate reports bill..... n583
Sweden, development in..... 471
Utilizing all the head e973
Winnipeg River project begun..... n714
Watersheds and administrative areas should coincide (C. G. Lynam)..... letter 239
Water-storage study, Utah counties unite in n535

WATER-SUPPLY

Additional, rendered unnecessary by metering, at Middletown, Conn..... 615
Albany, N. Y., dam and reservoir without spillway..... 713
And goiter, relation between..... 516
Baltimore: sanitary effect of water storage in open reservoirs (A. Wolman and S. T. Powell) *804
Bristol, Conn., paying for water-main extensions at..... 772
Burlington, Vt., treated..... 655
Chile, constructing 98-km. conduit, (G. H. Bayles) ....*593; correction 1063
Cincinnati completing meter program... 876
Cleveland, Ohio, more filters..... n293
Columbus, Ohio, proposed enlargements.. 885
Control of new streets in relation to extension of water mains (B. Brewer) 705
Des Moines, manager for water-works to be selected..... n679
Economy in operation, Omaha..... 8
Filters, drifting-sand, results at Toronto (M. J. Howard) a*822
Filtration plant, upkeep problems at.... n935
From snow fields, determination of.... *766
Goiter, relation between goiter and water-supply 516

*, illustrated; e, editorials; h, hints; n, news notes; a, abstracts.